Hooker, W. J.

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HOOKER'S

ICONES PLANTARUM;

OR,

FIGURES, WITH DESCRIPTIVE CHARACTERS AND REMARKS,
OF NEW AND RARE PLANTS,

SELECTED FROM THE

KEW HERBARIUM.

FIFTH SERIES.

EDITED FOR THE BENTHAM TRUSTEES BY

SIR DAVID PRAIN, C.M.G., C.I.E., LL.D., F.R.S.

LATE DIRECTOR, ROYAL BOTANIC GARDENS, KEW.

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TO THE PLATES AND NAMES

The names given in **clarendon** type are those of plants described in the work; an * is prefixed to the names of those not figured. Synonyms are printed in *italics*; names in roman characters are those of plants mentioned in the text.

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M.S del.t et lith.

Tabula 3001.

GALBULIMIMA BACCATA, *F. M. Bailey.*

Magnoliaceae. Tribus Illicieae.

Galbulimima, *F. M. Bailey in Queensl. Dep. Agric., Bot. Bull.* ix. p. 5 (1894); *Queensl. Fl.* pars 1, p. 19; calyce ad *Drimytem*, Forst., staminibus ad *Belliolum*, Van Tiegh., ovulo solitario ad *Illicium*, Linn., fructu ad *Zygogynum*, Baill., accedit.

Sepala 2, clausa, calyptratim decidua, exterius interius includens. *Petala* circiter 7, lanceolata. *Stamina* circiter 40, lanceolato-oblonga usque ad linearia, extra supra basin antheras dithecas longitudinaliter dehiscentes gerentia. *Staminodia* circiter 13, subulata. *Carpella* 7–9, arcte contigua, sed ima basi excepta libera, uniovulata. *Ovulum* ab apice suturae ventralis pendulum, anatropum, raphe dorsali. *Fructus* globosus, carnosus, 7–10-locularis, carpellis coalitis, unis alia superantibus, omnibus stigmatis cicatrice notatis; loculi compressi; endocarpium cartilagineum. *Semina* pendula, endospermio oleagineo; embryo minusculus, juxta hilum situs.

G. baccata, *F. M. Bailey, ll.cc.; Compr. Cat. Queensl. Pl.* p. 25, fig. 8; species unica.

Arbor sempervirens, circiter 15 m. alta, trunco circiter 0·5 m. diametro. *Ramuli* novelli propter indumentum squamarum imbricantium aenei, angulati, mox fuscescentes, subteretes. *Folia* alterna, lanceolato-oblonga, apice obtusa vel subacuta, interdum brevissime obtuse acuminata, basi subcuneata, 7–11 cm. longa, 2·5–4 cm. lata, coriacea, minute pellucide punctata, supra glabra, fusco-viridia, nitidula, subtus squamis minusculis ferrugineis punctata, brunnea; nervi in sicco supra prominentes, subtus prominuli, nervi laterales 9–10 utroque latere costae, patuli, in nervum intramarginalem circiter 5 mm. a margine distantem connexi; petioli 1·5–2 cm. longi, dense squamosi. *Inflorescentiae* axillares, 1–2-florae, squamis stellatis imbricantibus obtectae; pedunculus quadrangularis, 0·5–1 cm. longus; pedicelli circiter 4 mm. longi; bracteae angulatae, pedicellis breviores. *Alabastra* ovoidea, ante anthesin 1 cm. longa. *Torus* vix 1·5 mm. longus, superne in fossam circularem 0·4 mm. altam excavatus. *Sepala* densissime squamosa, exterius unicostatum. *Petala* 4–6 mm.

longa. *Stamina* 6–9 mm. longa, antheras 1–1·7 mm. supra basin gerentia; thecae 2, discretae, lineari-oblongae, 1·5–2 mm. longae. *Staminodia* 6–8 mm. longa. *Carpella* compressa, vix 2 mm. longa, dense squamosa, in fossa apicali tori sita; stigmata rostriformia; ovulum circiter 0·5 mm. longum. *Fructus* kermesinus, suturis irregularibus circiter 9, areis intersuturalibus superne cicatrice stigmatis notatis; endocarpium semi-ellipticum, valde compressum, circiter 1·5 cm. longum, 6–7 mm. latum.

AUSTRALIA: Queensland; Eumundi, *E. H. Arundell*; Boar Pocket and Evelyn, Herberton District, *J. F. Bailey*; Kin Kin, *W. D. Francis*.

There can be little doubt that Mr. F. M. Bailey, to whom Kew is indebted for material of *Galbulimima*, was justified in referring this interesting genus to the *Magnoliaceae*, tribe *Wintereae* (*Illicieae*). In the pellucid-punctate leaves and closed calyx *Galbulimima* recalls *Drimys*, though the latter has only a single calycine envelope instead of two; the petal-like stamens bearing two distinct extrorse thecae near the base are like those of *Belliolum*; the syncarpous fruit suggests affinity with *Zygogynum*, and the uniovulate carpels affinity with *Illicium*.

The anatomy of *Galbulimima baccata* has been examined by Mr. Boodle, who contributes the following account: 'The wood contains true vessels as in nearly all Dicotyledons. In this, *Galbulimima* agrees with the *Magnolieae* and *Illicium*, but differs from *Drimys* and the other genera included by Van Tieghem in the *Drimytaceae*, *Tetracentraceae* and *Trochodendraceae*,* which together constitute his group *Homoxyleae*. Secretory cells containing oil occur in the mesophyll of the leaf; and the endosperm is oily, containing protein and oil, but no starch. Oily endosperm is a character of the *Magnoliaceae*, and oil-containing secretory cells are found in several members of this family. Sclerotic cells occur in the pith, and are so disposed as to cause partial septation. This feature shows agreement with the tribe *Magnolieae*.† Small peltate scales are present on the lower side of the mature leaf, and are abundant on the inflorescence and young parts. Peltate scales appear not to have been found hitherto on any member of the *Magnoliaceae*, but they occur in certain *Anonaceae* and *Monimiaceae*.'

The peculiar appearance of the fruit, which is said to resemble that of a *Callitris*, is due to the unequal development of the carpels. In a fruit composed of nine carpels, for example, only three or four

* *Journal de Botanique*, vol. xiv. p. 259 (1900).

† Solereder (Syst. Anat. Dicot., Engl. ed. p. 30) mentions that 'more or less distinct septation of the pith by diaphragm-like groups of sclerosed cells' is characteristic of the *Magnolieae*.

of these reach the apex, the remaining six or five being of various lengths. The longest carpels meet over the tops of the others, and those of intermediate length meet the longest ones over the tops of the shortest, thus giving rise to the characteristic areolation of the fruit. It has been suggested * that the fruit may not belong to the same plant, but it has been since ascertained by us that no such error has occurred.—T. A. Sprague.

Fig. 1, flower-bud; 2, section through same; 3, scales outside calyx; 4, petal; 5 and 6, stamens; 7, staminode; 8, pistil and torus; 9, transverse section through same; 10, fruit; 11, transverse section through the fruit; 12, endocarp and an old ovule (inverted). *All enlarged except* 10 *and* 11, *which are of natural size.*

N.B.—Most of the stamens in the fully expanded flower are relatively longer and narrower than in 5 and 6. The syncarpous appearance of 9 is due to the carpels being closely pressed against one another.

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* Pilger in Engl. & Prantl, Nat. Pflanzenfam. Nachtr. III. p. 109; Dalle Torre & Harms, Gen. Siphonog. p. 608.

Tabula 3002.

CEPHALONEMA POLYANDRUM, *K. Schum.*

Tiliaceae. Tribus Tilieae.

Cephalonema, *K. Schum. in Schlechter, Westafr. Kautschuk Exped.* p. 299, nomen ; *De Wild. in Ann. Mus. Congo,* sér. 5, vol. i. pp. 53, 164, vol. ii. pp. 46, 298, nomen ; *Miss. É. Laurent,* vol. i. p. 151, nomen ; *Not. Pl. Util. Congo,* p. 29, nomen ; *Sprague in Kew Bull.* 1909, p. 325, descr. ; affinis *Honckenyae,* Willd., a qua floribus luteis staminibus numerosis capsula alata recedit.

Flores quoad calycem et corollam tetrameri (nonnunquam, ut videtur, pentameri). *Sepala* extra infra apicem corniculata. *Petala* lutea. *Staminodia* numerosissima, extra stamina inserta. *Stamina* numerosissima, interiora exterioribus sesquilongiora ; antherae dorsifixae, thecis contiguis. *Ovarium* oblongum, acute angulatum, 5–6-loculare, loculis angulis oppositis ; stigmata subulata ; ovula pro loculo numerosa, biseriata. *Capsula* oblonga, 5–6-alata, 5–6-locularis, alis rigide setoso-pectinatis, loculicida.

C. polyandrum, *K. Schum. l.c. ; De Wild. ll.cc. ; Sprague, l.c.,* descr. : species unica.

Frutex usque 4 m. altus. *Folia* late ovata, indivisa, vel angulato-suborbicularia, interdum leviter triloba, basi cordata, apice longe acuminata, 9–14 cm. longa, 6–10 cm. lata, subdupliciter serrata, supra exsiccando brunnea, sparse stellato-puberula praecipue in nervis, subtus pallidiora, in nervis stellato-pubescentia ceterum puberula, basi 7-nervia, nervis supra obviis subtus conspicuis, tertiariis regulariter parallelis plerumque 2–4 mm. distantibus ; petioli 3–7 cm. longi ; stipulae subulatae, obtusae, circiter 6 mm. longae, ferrugineo-pubescentes. *Sepala* spathulato-linearia, 2 cm. longa, superne 3 mm. lata, 3 mm. supra basin leviter constricta, 1·5 mm. lata, extra minute puberula, cornu subapicali 0·7 mm. longo. *Petala* oblanceolata,

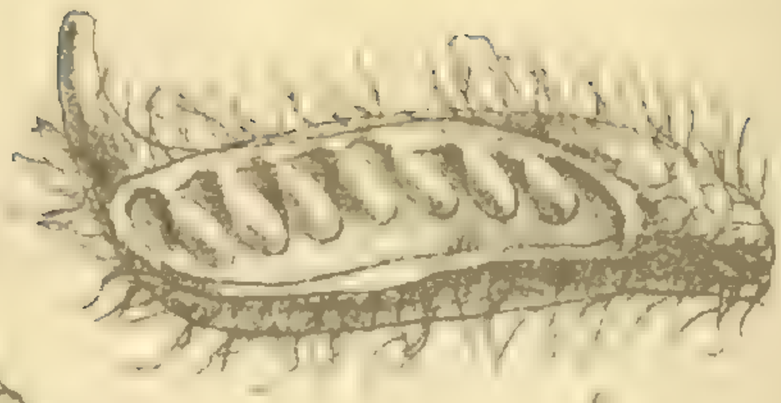
1·8 cm. longa, 5–6 mm. lata, ciliolata. *Staminodia* ultra 100, usque ad 9 mm. longa; antherae rudimentariae 0·3–0·4 mm. longae. *Stamina* circiter 80, exteriora 1·1 cm. longa, interiora 1·6 cm. longa; antherae oblongae, eae staminum breviorum 0·7 mm. longae, eae longiorum fere 1 mm. longae. *Ovarium* circiter 2 mm. longum, pentagonum vel hexagonum, pubescens, cito post anthesin setosum; stylus circiter 5 mm. longus; stigmata 5–6, divergentia vel leviter recurva. *Capsula* 3·5–4 cm. longa, alis 3–5 mm. latis, setis marginalibus 2–4 mm. longis spinulo terminatis minute puberulis; areae interalares reticulato-areolatae, areolis plerumque pentagonis setulas singulas medio gerentibus; septa post dehiscentiam angulo interno fibroso-ciliata, fibris adscendentibus. *Semina* plano-convexa, ambitu late obovata, anatropa, albuminosa, ultra 2 mm. longa, fere 2 mm. lata, leviter tuberculata, superficie convexa praesertim. *Testa* ad chalazam indurata, fusca, raphi gracili fusca. *Embryo* rectus; cotyledones transverse ellipticae, basi cordatae; radicula crassa.

Tropical West Africa: Cameroons; Yaunde, *Zenker*, 1488. Congo State; Between Kisantu and Popocabaka, *Gillet*, 2298; near Kimuenza, *Gillet*, 1683; valley of the Djuma River, *Gillet*, 2734; *Gentil*; in thickets and at the edge of woods near Coquilhatville, *Schlechter*, 12594; at Eala, *Marc Laurent*; Equateur District, *Pynaert*; Lulonga, *Pynaert*, 764; *É. Laurent*; Romée, *É. Laurent*. Spanish Gaboon; *Tessmann*, 475.

The genus *Cephalonema* is closely allied to *Honckenya*, from which it differs principally in the capsule. The capsule of *Honckenya* is terete and bristly all over, whereas that of *Cephalonema* has a broad wing opposite the middle of each loculus, and the bristles are confined to the margins of the wings. In *Honckenya* the loculi are subdivided by incomplete transverse septa between the seeds; these are wanting in *Cephalonema*.

According to Gentil, quoted by De Wildeman (Not. Pl. Util. Congo, p. 30), *Cephalonema polyandrum* yields a fibre used for rope-making in the Congo.—T. A. Sprague.

Fig. 1, section of flower; 2, stamens and staminodes; 3, anthers; 4, pistil; 5, transverse section of ovary; 6, seed, showing raphe and chalaza; 7, embryo. *All enlarged.*



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M.S. del^t et lith.

Tabula 3003.

ISOBERLINIA DOKA, *Craib et Stapf.*

Leguminosae. Tribus Amherstieae.

I. Doka, *Craib et Stapf in Kew Bull.* 1912, p. 94; ab *I. Dalzielii*, Craib et Stapf, foliolis glabris distinguenda.

Arbor, inflorescentia excepta glabra; ramuli pallide corticati. *Folia* abrupte pinnata, ad 2·6 dm. longa, petiolo 4·5–7·5 cm. longo suffulta, rhachi petioloque teretibus; foliola 3-juga, ovato-elliptica ad ovato-lanceolata, apice rotundata vel plerumque subacuminata, obtusiuscula, interdum parum retusa, basi subtruncata vel rotundata vel late cuneata, nonnunquam inaequilateralia, 8–13 cm. longa, 4·5–7 cm. lata, subcoriacea, nervis lateralibus utrinsecus 8–10 supra conspicuis subtus prominulis, nervis transversis utrinque subprominulis; petioluli 5–7 mm. longi. *Panicula* terminalis, 12–18 cm. longa, 4–8 cm. diametiens, e racemis spiciformibus ad 10 cm. longis composita, ramis primo minute pilosulis mox glabris; bracteae late ovatae, acutae, ad 4 mm. longae, deciduae; bracteolae 9 mm. longae, 6 mm. latae, extra minute fulvo-pilosulae, intus adpresse albo-pubescentes. *Receptaculum* 3·5 mm. longum, 2 mm. latum, glabrum. *Sepala* 7 mm. longa, 1·75 mm. lata, subaequalia, glabra. *Petala* ad 1 cm. longa, 3·75 mm. lata, subaequalia, glabra, breviter unguiculata. *Filamenta* 1·4 cm. longa, inferne parce pilosa. *Ovarium* brunneo-pilosum, circiter 5 mm. altum, ovulis 6–7. *Legumen*, ut videtur, glabrum, circiter 28·5 cm. longum, 7 cm. latum et 7 mm. crassum.

Tropical West Africa: Northern Nigeria; Katagum, *Dalziel*, 364; Sokoto, *Dalziel*, 334; Zaria, *Dudgeon*, 9, possibly.

The genus *Isoberlinia*, one of the three species of which is here figured, may be distinguished from *Berlinia* by the longer panicles, the smaller subsessile flowers with a short receptacle, and more particularly by the five petals being subequal, shortly unguiculate and subequal to or only slightly exceeding the sepals.

The description of the pod is added, doubtfully, from a specimen collected by Mr. G. C. Dudgeon at Zaria, which consists of two leaves and is accompanied by a sketch of the pod.—W. G. Craib.

Fig. 1, flower with bracteoles; 2, androecium and pistil; 3 and 4, stamens; 5, ovary cut open longitudinally. *All enlarged.*

M.S.delt et lith.

Tabula 3004.

PAREUGENIA IMTHURNII, *Turrill.*

Myrtaceae. Tribus Myrtoideae.

Pareugenia, *Turrill.* Genus novum *Eugeniae* (§ *Syzygio*) Linn. affine, sed staminum filamentis in phalanges 8–16 connatis superne liberis.

Petala 5, in calyptram connata. *Stamina* numerosa, in phalanges 8–16 distincte connata, superne libera, antheris bilocularibus basifixis vel leviter versatilibus. *Ovarium* biloculare, ovulis in loculis numerosis pluriseriatis, placentis prominentibus axilibus.—Arbor *parva*. Folia *opposita*.

P. Imthurnii, *Turrill*; species unica.

Arbor parva, ramis teretibus glabris cortice pallido obtectis. *Folia* elliptico-ovata vel oblongo-ovata, apice leviter obtuse acuminata, rotundata vel retusa, basi acuta vel subcuneata, usque ad 9 cm. longa et 4·8 cm. lata, coriacea, pagina utraque glabra, integra, nervis lateralibus parallelis utrinsecus circiter 20; petioli usque ad 1·5 cm. longi, glabri. *Inflorescentia* terminalis, corymbosa, floribus usque ad 20; pedicelli 0·5–1 cm. longi, robustiores, glabri; bracteae oppositae, persistentes, suborbiculares, apice rotundatae, 2 mm. longae, 1·5 mm. latae, sessiles, glabrae; bracteolae 2, oppositae, vel 4, oppositae et decussatae, bracteis similes. *Calyx* indistincte 4-lobatus, lobis apice rotundatis glabris. *Petala* 5, in calyptram connata, late orbicularia, apice rotundata, circiter 5 mm. longa et 7 mm. lata, coriacea, glabra. *Stamina* numerosa, polyadelphia, glabra, filamentis (parte connata inclusa) usque ad 1·2 cm. longis, antheris 0·75 mm. longis. *Receptaculum* turbinatum, 5–6 mm. altum, 5–6 mm. diametiens, glabrum. *Ovarium* biloculare, ovulis in quoque loculo circiter 12; stylus cylindricus, 6 mm. longus, glaber, stigmate subcapitato.

Polynesia: Fiji; without precise locality, *im Thurn*, 262.

The plant here described is undoubtedly allied to *Eugenia*, a genus well represented in Fiji and other Polynesian groups. The union of

the filaments, however, appears to be a character of sufficient importance to justify the formation of a new genus. The stamen bundles vary in number between 8 and 16 and it seems likely that the number increases by the splitting up of some of the coalescent portions as the flower becomes older, but even in fully opened flowers the bundles are quite distinct and have numerous free upper portions each bearing a bilocular anther. The arrangement and structure of the whole androecium support the view that the bundles represent united, not branched filaments. Throughout the family *Myrtaceae* we find a number of scattered genera with the stamens aggregated in phalanges, but as a rule the number of phalanges is definite and each phalange has a definite orientation with regard to a petal. In *Tristania*, for example, there are 5 groups of stamens opposite to the petals. For the material on which this account of the genus *Pareugenia* is based Kew is indebted to that distinguished naturalist and statesman Sir Everard im Thurn, K.C.M.G., by whom it was met in the course of his official duties while Governor of Fiji and High Commissioner of the Western Pacific. To his field note we owe our knowledge of the habit of the species ; the precise locality in Fiji in which the specimens were collected has not been recorded.—W. B. Turrill.

Fig. 1, flower-bud ; 2, longitudinal section of flower with the perianth removed ; 3, phalange of stamens ; 4, anthers ; 5, transverse section of ovary. *All enlarged.*

M.S. del. et lith.

Tabula 3005.

HYPTIANTHERA STRICTA, *Wight et Arn.*

Rubiaceae. Tribus Gardenieae.

H. stricta, *Wight et Arn. Prod.* p. 399 ; *Hook f. Fl. Brit. Ind.* vol. iii. p. 121, pro parte ; *Prain, Bengal Plants,* vol. i. p. 568 ; *Brandis, Indian Trees,* p. 384 ; *Haines, For. Fl. Chota Nagpur,* p. 504 ; ab *H. bracteata,* Craib, cui facie persimilis, stipulis bracteis calycisque lobis brevioribus distinguenda.

Frutex vel *arbuscula* sempervirens ; ramuli glabri, fusci, tetragoni. *Folia* lanceolata vel oblongo-lanceolata, nonnunquam oblanceolata vel oblongo-oblanceolata, apice acuminata, acuta, basi saepissime cuneata, usque ad 17 cm. longa et 3·9 cm. lata, chartacea, glabra, nervis lateralibus utrinsecus 7–9 pagina superiore saepius parum immersis inferiore prominentibus intra marginem anastomosantibus, nervis transversis supra subconspicuis subtus prominulis, petiolo 5–7 mm. longo suffulta ; stipulae deltoideo-lanceolatae, apice subulato-acuminatae, dorso carinatae, 6–8 mm. longae. *Flores* albi, in fasciculos axillares densos aggregati, sessiles ; bracteae deltoideae, acuminatae, 2·5 mm. longae ; bracteolae binae, circiter 1·5 mm. longae, simul ac bracteae ciliatae intusque adpresse albo-pubescentes. *Receptaculum* vix 1 mm. altum, puberulum. *Calycis* tubus circiter 0·5 mm. longus ; lobi 1·75 mm. longi, acute acuminati, ciliati, simul ac tubus intus breviter adpresse pubescentes. *Corolla* 4 mm. longa, lobis tubo subaequilongis, lobis subellipticis apice rotundatis raro paulo emarginatis, extra glabra, intus in lobis et sub antherarum basibus albo-strigosa. *Antherae* 1·5 mm. longae, dorso strigosae, connectivo lato apice producto. *Discus* carnosus, calycis tubum paulo superans. *Stylus* 3 mm. longus, basi glaber, superne densissime albo-pubescens, ramis 2 mm. longis.—*Randia stricta,* Roxb. Hort. Beng., p. 15, *et* Fl. Ind., vol. i. p. 526 ; DC. Prod., vol. iv. p. 386. *Macrocnemum strictum,* Roxb. ex Roem. et Sch. Syst., vol. v. p. 6. *Rondeletia stricta,* Roth Nov. Pl. Sp., p. 140, syn. excl. *Hypobathrum strictum,* Kurz For. Fl. Brit. Burma, vol. ii. p. 50.

India : United Provinces ; Oudh, *R. Thompson* ; Kheri, *Inayat,* 22383. Sikkim ; 3–600 m., *J. D. Hooker.* Bhutan ; *Griffith,* 2108

(K.D. 2827 pro parte). Chittagong; *J. D. Hooker*. Upper Burma; Bhamo, *Griffith*, K.D. 2827 pro parte. Without precise locality, *Wight Cat.*, 1281; *Roxburgh*.

In addition to the localities quoted above, the species is recorded by both Prain and Haines, ll.cc., as occurring in Chota Nagpur. As yet, however, no specimens from either Singbhum or the Santal Parganahs have been received at Kew. In the Flora of British India and in Indian Trees, a Khasia-Yunnan plant is quoted as referable to *H. stricta*; in the writer's opinion this Khasia plant belongs to a quite distinct species.—W. G. Craib.

Fig. 1, flower with bracteoles; 2, flower, corolla removed; 3, corolla, laid open; 4, anther, back and front view; 5, transverse section of ovary. *All enlarged.*

O. Stapf. anal.

Tabula 3006.

HELIOTROPIUM GOSSEI, *Stapf.*

Boraginaceae. Tribus Heliotropieae.

H. Gossei, *Stapf*, affine *H. tenuifolio*, R. Br. sed minus canescens et staminibus multo minus alte insertis, stigmatis forma et nuculis sparse minutissime setulosis distincta.

Herba, forsan perennis, circiter 20 cm. alta, undique setulis rigidis tenuibus albis appressis laxiuscule vestita, caulibus gracilibus inferne induratis. *Folia* alterna, linearia, acuta, 12–35 mm. longa, 0·5–0·75 mm. lata, supra nervo medio impresso, infra 2-sulcata. *Flores* bracteis foliis simillimis suffulti iisque longiores, subsessiles. *Calyx* 2·5–3 mm. longus ; sepala ovata, acute acuminata, dorso parce, basi copiosius setulosa, in margine magis minusve ciliata. *Corolla* alba, 5 mm. longa ; tubus 3 mm. longus, extra sparse minuteque setulosus, intus infra plicas commissurales lineis dense papilloso-pilosis notatus ; lobi explanati late rotundato-ovati, acuti, aestivatione involuto-valvati. *Stamina* 0·5 mm. supra basin inserta ; filamenta 0·5 mm. longa ; antherae vix 1 mm. longae, connectivo in acumen breve obtusum apice papillosum producto. *Ovarium* subglabrum, stylo subaequilongo ; stigma capitatum, 5-sulcatum, apiculo brevissimo obtuso pilosulo. *Nuculae* late ovoideae, apicem versus sparse minutissime setulosae, 1 mm. longae.—*Notonerium Gossei*, Benth. in Hook. Icon. Plant., t. 1180 ; K. Schum. in Engl. Nat. Pflanzenf., vol. iv. pars 2, p. 133, fig. 52 A,B.

Australia : South Australia ; Interior, without precise locality, *Gosse*.

The material of this species available for study is very scanty. This circumstance probably accounts for the misinterpretation of its taxonomic position in the Genera Plantarum, again at t. 1180 of the present work, and once more in the Natürlichen Pflanzenfamilien, which it is the object of the present description to adjust. The very characteristic hairs of the indumentum suggest a comparison of the species with Boraginaceous rather than with Apocynaceous plants, and closer study of its salient characters shows it to be a *Heliotropium*,

in which genus it is one of a group of probably four closely allied but fairly distinct species aggregated by Bentham in the Flora Australiensis, vol. iv. p. 399, under *H. tenuifolium*, R. Br. The contrast emphasised in the differential diagnosis is with specimens from the Gulf of Carpentaria collected by Brown which form the basis of his species. If the printed label which accompanies the specimen delineated (Mr. Gosse's Expedition. Interior of South Australia. Comm. R. Schomburgk, May 1874) could be taken literally, the locality in which *H. Gossei* was collected ought to lie somewhere between the Mann and the Musgrave Ranges or within the latter range. But Gosse's expedition also covered considerable ground in the south-western corner of the Northern Territory (from Reynold Range to Mann Range) and extended for a short distance into West Australia, so that the precise locality of the species is doubtful.—O. Stapf.

Fig. 1, tip of leaf, upper side; 2, hair; 3, sepal; 4, corolla-tube laid open; 5, a corolla-lobe; 6, anthers; 7, pistil; 8 and 9, nucules. *All enlarged.*

Tabula 3007.

ANTHEROTHAMNUS PEARSONII, *N. E. Brown.*

Scrophulariaceae. Tribus Cheloneae.

Antherothamnus, *N. E. Brown.* Genus novum affine *Freyliniae*, Colla, sed foliis alternis fasciculatis et antheris unilocularibus apte distinguitur.

Calyx 5–7-partitus, segmentis apertis vel subdistantibus linearibus. *Corollae* tubus anguste infundibuliformis ; lobi 5, subaequales, patuli, 2 postici exteriores. *Stamina* 4, didynama, inclusa ; staminodium 1 ; antherae ellipticae, uniloculares. *Ovarium* 2-loculare, loculis pluriovulatis ; stylus filiformis, superne leviter incrassatus ; stigma parvum. *Fructus* ignotus.—Frutex *glaber*. Folia *perparva*, *alterna*, *fasciculata*. Racemi *e fasciculis foliorum orientes*.

A. Pearsonii, *N. E. Brown* ; species unica.

Frutex ramosus, 0·30–3 m. altus, ubique glaber ; rami patuli cortice cinereo-brunneo. *Folia* alterna, fasciculata, 3–5 mm. longa, 1–1·5 mm. lata, obovato-cuneata, obtusa vel subacuta, basi attenuata, subcrassa, marginibus interdum subrevolutis. *Racemi* 1–2 cm. longi, e fasciculis foliorum enati, foliis parvis bracteati. *Pedicelli* alterni, 2–4 mm. longi, superne bibracteati. *Bracteae* oppositae, 0·6–1 mm. longae, lineares. *Calyx* 5–7-partitus, segmentis erectis subdistantibus linearibus obtusis. *Corolla* alba, per noctem fragrans ; tubus 3–4 mm. longus, ore 1·7–2·5 mm. diametro, anguste infundibularis ; lobi 5, suborbiculares, 1·3–1·6 mm. diametro, 2 inferiores leviter minores. *Stamina* 4, didynama, in corollam inserta, inclusa ; filamenta filiformia ; antherae subgloboso-ellipticae, 1-loculares. *Ovarium* ovoideum, 2-loculare ; stylus filiformis, superne gradatim incrassatus, apice curvatus ; stigma parvum.

South Africa : Bushmanland ; rocky places at the foot of a hill near Groot Rozynbosch, *Pearson*, 3619. Great Namaqualand ; between Dabaigabis and Grundoorn, 1250 m. alt., *Pearson*, 3149 ; hill about 15 miles south of Warmbad, *Pearson*, 4377 ; Krai Kluft Ravine, Great Karasberg Range, 1500 m. alt., *Pearson*, 8284.

The genus *Antherothamnus* is certainly very closely allied to *Freylinia*, but the different appearance of the plant, the small alternate fasciculate leaves and 1-celled anthers clearly indicate the necessity for a generic distinction. There is also the further peculiarity that the dried flowers of *Antherothamnus* when softened in boiling water for dissection become remarkably soft and pulpy or subdeliquescent. The species which forms the type of the genus was discovered by Prof. H. H. W. Pearson during the Percy Sladen Memorial Expedition in South-West Africa in 1908–1909. He states that it is 'extremely common on the granite in the Great Karasberg Range' and that it is 'a charming shrub with flowers delightfully scented at night.'—N. E. Brown.

Fig. 1, flower with pedicel and bracts; 2, part of the calyx, with the ovary and style; 3, corolla, laid open, showing stamens and staminode; 4, stamens, front and back views; 5, a transverse section through the ovary. *All enlarged.*

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M.S. del. et lith.

Tabula 3008.

CYRTOGONONE ARGENTEA, *Prain.*

EUPHORBIACEAE. Tribus CROTONEAE.

C. argentea, *Prain in Kew Bull.* 1911, p. 232, *Pax in Engl. Pflanzenr. —Euphorb. Acalyp. Chrozophor.* p. 111 (1912) et *in Dyer, Fl. Trop. Afr.* vol. vi. pars 1, p. 815 (1912) ; species unica.

Arbor dioica 8–12-metralis, ramulis densissime lepidotis. *Folia* longe petiolata, coriacea, elliptica vel obovato-oblonga, abrupte acuminata, basi late cuneata vel rotundata, margine integra vel casu apicem versus denticulata vel minute acute lobulata, 15–25 cm. longa, 7–13 cm. lata ; supra glabra, opaca, atroviridia ad basin ipsam distincte 2-glandulosa, subtus densissime lepidota, argentea, nitidula ; petiolus 6–10 cm. longus, dense lepidotus apice basique simul incrassatus ; stipulae minutae, lepidotae. *Panicula* ubique lepidota, 25–30 cm. usque longa, basi 10 cm. diametro ; rhachis ramulos 15–20 inter se 0·5–1·5 remotos 3–7 cm. longos emittens ; ramuli cymas 3–7 sufful-cientes ; cymae 3–7-florae pedunculis 3–5 mm. longis ; bracteae ovatae, lanceolatae, 1–1·5 mm. longae ; pedicelli 4–5 mm. longi. *Calyx* in alabastro globosus, 6–8 mm. latus, clausus, dein 2–3-fissus, densissime lepidotus. *Petala* 5, raro 6, contorto-imbricata, primum omnino extra, ultimo omnino intus, orbicularia, glabra, albida. *Stamina* 27–30 ; filamenta glabra, libera, 3 mm. longa ; antherae 1 mm. longae locellis connectivo latiusculo affixis, introrsim spectantes ; glandulae receptaculi omnes juxta staminales. *Ovarii* rudimentum 0. —*Crotonogyne argentea*, Pax in Engl. Bot. Jahrb. vol. xxxiii. p. 283 (1903).

TROPICAL WEST AFRICA : Upper Guinea ; Southern Nigeria, Oban, *Talbot*, 1590 ; Cameroons, Bipinde District at Mimfia, *Zenker*, 2029, 2359, 3078, 3668 ; Bijoka, *Zenker*, 3893, 3894. Lower Guinea : Spanish Guinea, Nkolentangan, 450 m., *Tessmann*, 28.

The species here figured, while agreeing with *Crotonogyne*, Müll. Arg., as regards foliage and indumentum, differs so markedly as regards its corolla and androecium, the former having free in place of united male petals and the latter having interstaminal as well as extrastaminal receptacular glands, that it is necessary to treat it as the type of distinct genus. The female flowers and fruit are still unknown.—D. PRAIN.

FIG. 1, apex of petiole and base of leaf ; 2, male flower-bud ; 3, scale from male calyx ; 4, male flower, young, the petals laid open ; 5, male androecium, fully developed ; 6, two stamens with three receptacular glands. *All enlarged.*

O. Stapf. anal. figs 5-10.

Tabula 3009.

HAMILCOA ZENKERI, *Prain*.

Euphorbiaceae. Tribus Crotoneae.

H. Zenkeri, *Prain in Kew Bull.* 1912, p. 107, et *in Dyer, Fl. Trop. Afr.* vol. vi. pars 1, p. 1000 ; species unica.

Frutex scandens, 6–8 m. altus, glaberrimus, ramulis laevibus viridibus. *Folia* alterna, plerumque versus apices ramulorum longe nudorum aggregata ; laminae elliptico- vel ovato-oblongae vel ad lanceolatum vergentes, integrae vel remote obsolete dentatae, interdum uno latere vel utrinsecus late excisae et hinc irregulariter lobatae, 10–25 cm. longae, 4–10 cm. latae, subcoriaceae, nervis utrinsecus 7–10 intra marginem arcuatim conjunctis uti venarum reticulatione utrinque prominentibus ; petioli longitudine valde varii, superiores plerumque breviores, 8–0·5 cm. longi, teretes, apice pulvinati geniculatique ; stipulae e cicatricibus minutae, caducae. *Racemi* ♂ ex axillis foliorum superiorum orti, ad 5 cm. (raro ultra) longi, fere tota longitudine bracteati, bracteis vero superioribus solis fertilibus ; bracteae minutae, rotundatae, erosulae ; bracteolae 2 ad pedicellorum bases bracteis consimiles ; pedicelli juveniles nutantes, sursum incrassati, 6–8 mm. longi. *Perianthium* in alabastro globosum, maximum visum 4 mm. diametiens. *Sepala* 5, lata, valde imbricata, ovato-oblonga, obtusa. *Stamina* 18–20, in receptaculo carnosulo dense conferta, subsessilia, libera ; antherae late ellipticae, juxta basin dorsifixae, loculis parallelis contiguis longitudinaliter dehiscentibus, exteriores extrorsi. *Ovarii* rudimentum nullum. *Racemi* ♀ terminales, fructiferi ad 5 cm. longi, parciflori, bracteati ; bracteae bracteolaeque ut in mare ; pedicelli sub anthesi circiter 5 mm. longi, fructiferi ad 2·5 cm. longi, flexuosi vel nutantes. *Sepala* 6, quam in mare minora, imbricata, 3 exteriora, 3 interiora, rotundata, minute erosula vel integra, vix 1 mm. longa. *Ovarium* 3-loculare ; styli columna brevissima, crassa ; rami 3, erecti, conniventes, oblongi, ad 4 mm. longi, marginibus recurvis, dimidiis ramorum binorum approximatorum basi confluentibus ; ovula in loculis solitaria. *Fructus* 3-lobus ; cocci loculicide fissi, 1–1·5 cm. alti et longi. *Semina* subglobosa, 1 cm. diametro ; testa crustacea, ochracea, vittis maculisque badiis pulchre marmorata ; albumen

carnosum. *Embryo* maturus haud visus.—*Plukenetia Zenkeri*, Pax in Engl. Jahrb. vol. xliii. p. 83.

Tropical West Africa: Cameroons; Bipinde District, Mimfia, in virgin forest, *Zenker*, 2856, 3028*b*, 3676, 4130.

Dr. Pax, the distinguished authority on the natural family *Euphorbiaceae*, who first described this interesting species, referred it tentatively to the genus *Plukenetia*, Linn., from which, however, it differs in having a 3-locular ovary; the ovary in *Plukenetia* is normally 4-locular.

There is, as has been pointed out by the author of the genus, a certain resemblance, both as regards the structure of the male flowers and as regards the foliage, in *Plagiostyles africana*, Prain, and *H. Zenkeri*. The structure of the female flowers and fruits is, however, very different in the two genera.—O. Stapf.

Fig. 1, male inflorescence; 2, male flower; 3, longitudinal section of male flower; 4, anthers; 5, female flower; 6, transverse section of ovary; 7, longitudinal section of ovary; 8, fruit, with one coccus entire (top), one beginning to dehisce (right) and one completely dehisced (left); 9, seed; 10, section of ripe carpel and seed (v. capsule-valve; t. spongy testa with cavity; i.t. inner hard lining of testa; n.c. nucleus cavity; end. endosperm; emb. imperfect embryo). *All enlarged, except* 1 *and* 8, *which are of natural size.*

Tabula 3010.

PLAGIOSTYLES AFRICANA, *Prain*.

Euphorbiaceae. Tribus Crotoneae.

P. africana, *Prain in Kew Bull.* 1912, p. 107 ; species unica.

Arbor ad 12 m. alta, glaberrima, ramulis teretibus cortice badio vel fusco tectis. *Folia* alterna, sparsa ; laminae oblongae, caudato-acuminatae, basi breviter acutae, integrae vel subdentatae, 10–25 cm. longae, 4–10 cm. latae, coriaceae, supra saturate virides, nitidulae, subtus pallidiores, nervis utrinsecus 8–10 intra margines arcuatim conjunctis, uti venarum reticulatione utrinque prominentibus ; petioli longitudine valde varii, 5–0·5 cm. longi, apice pulvinati geniculatique ; stipulae haud visae. *Racemi* ♂ simplices vel inferne compositi, ex foliorum superiorum axillis orti, 3·5–5 cm. longi ; pedicelli 2–5 mm. longi, basi bractea bracteolisque binis minutis suffulti. *Perianthium* in alabastro cupulare, depressum, apertum, sub summa anthesi patellare, 3–5 mm. diametiens, plerumque 6- (rarius 5- vel ad 8-) fidum, segmentis magis minusve inaequalibus late ovatis obtusis in alabastro juvenili imbricatis diu ante antherarum dehiscentiam eas nudantibus. *Stamina* subsessilia, plerumque 18, rarius 15 vel ad 21, in toro subplano congesta, serie extima cum perianthii lobis alternante ; antherae extrorsae, rotundae, 1·5 mm. longae, thecis parallelis contiguis connectivo angusto tota longitudine adnatae, longitudinaliter dehiscentes. *Ovarii* rudimentum nullum. *Racemi* ♀ simplices ex foliorum summorum axillis orti, longitudine pedicellis bracteisque ut in mare. *Perianthium* parvum, breviter cupulare, 5-fidum, segmentis triangularibus ovatis basi incrassatis extra glandula carnosa instructis. *Ovarium* ovoideo-globosum, uniloculare, sub anthesi 4 mm. longum ; stigma sessile, excentricum, crassum, subdisciforme ; ovulum ad normam solitarium, caruncula parva superposita, rarissime duo collateralia quorum unum abortivum. *Fructus* indehiscens, 1-spermus, transverse ellipsoideus, 16–18 mm. longus, 10 mm. altus latusque, stigmate persistente plane laterali instructus ; pericarpium coriaceo-carnosum, endocarpio tenuiter membranaceo. *Semen* ellipsoideum, subasymmetricum, hilo laterali, micropyle subcentrali, raphe venas prominulas versus chalazam radiantes emittente ; testa crustacea, laevis ; tegmen pro maxima

parte fungosum, magis minusve nucleo adhaerens ; albumen lutescens, firme carnosum, oleo solido repletum. *Embryo* magnus, transversus ; cotyledones cordatae, duplo latiores quam longae, venosae ; radicula brevis.—*Plagiostyles Klaineana*, Pierre in Bull. Soc. Linn. Paris, vol. ii. p. 1327 ; Pax in Engl. & Prantl, Nat. Pflanzenfam. Nachtr. II. pars 3, p. 38 ; De Wild. & Dur. in Bull. Herb. Boiss. sér. 2, vol. i. p. 836, *et* Reliq. Dewevr. vol. ii. p. 205 ; De Wild. Études Fl. Bas- et Moyen-Congo, vol. ii. p. 270 ; Th. et Hél. Durand, Syll. Fl. Congol., p. 487 ; C. H. Wright in Dyer, Fl. Tr. Afr., vol. vi. pars 1, p. 171 ; Prain in Dyer, l.c. p. 1001. *Daphniphyllum africanum*, Muell. Arg. in Flora, 1864, vol. xlvii. p. 536, *et* in DC. Prodr., vol. xvi. pars i. p. 5.

Tropical West Africa: Nigeria ; Oban, *Talbot*. Cameroons ; near Bipindi, *Zenker*, 1730, 2210, 2865, 3008*a*, *b*, 2865, 3539, 3646 ; Barombi, *Preuss*, 421 ; Johann Albrechtshöhe, *Staudt*, 496 ; Nkolibundi Station, 350 m., *Ledermann*, 894 ; Efulen, *Bates*, 374. Spanish Gaboon ; Kongui River, *Mann*, 1811 ; Bebao, *Tessmann*, 472. French Gaboon ; Libreville, *Klaine*, 555, 640, 645, 1010, 1095, 1096, 1202. Belgian Congo ; Stanley Pool district, Kimuenza, *Gillet*, 1716 ; Dembo marshes, *Gillet*, 1562 ; Sanda, *Oddon* ; Djuma Valley, *Gentil*.

This plant is remarkable on account of the very rare, if not unique, occasional presence of a second ovule, the family of *Euphorbiaceae* being otherwise very sharply divided into strictly 1-ovulate and strictly 2-ovulate genera. When Pierre described *Plagiostyles* (l.c., p. 1326), he said : 'Au sommet latéral de la loge unique, on voit deux ovules collatéraux et anatropes à opercule très petit, dont un seul devient fertile. L'ovule stérile prend la forme d'un petit disque induré et reste appliqué contre la graine tout près de son funicle.' This was in 1896. Later on, in 1899, he distributed specimens of *Plagiostyles* with this note 'Quand j'ai publié ce genre (Soc. Linn. Par. p. 1326) n'ayant . . . des fruits à ma disposition et ayant cru y voir à côté de la graine mûre un ovule avorté, j'ai placé le *Plagiostyles* parmi les Phyllanthées, mais il est bien certain que l'ovaire a *une seule loge uniovulée*. La plante est donc une Crotonée-Acalyphée.' The writer has had the good fortune, however, to find a mature fruit (Zenker, 3539) which showed exactly the condition described by Pierre in 1896, so that there can be no doubt that the ovaries of *Plagiostyles* may exceptionally contain 2 ovules, one of which becomes abortive at an early stage. The case in question is illustrated by figs. 12 and 14. The funicle of the aborted ovule and that of the perfect one which developed into a normal seed sprang side by side from the normal point of attachment. The former was free and could easily be lifted up; the latter, in the mature seed, was adnate to the seed, forming its raphe. Hardly less remarkable is the transformation

which the ovary undergoes during maturation. In the flower the normally solitary ovule is pendulous from near the apex of the cell. and its orientation is in the longitudinal axis of the pistil. After fertilisation, however, growth becomes asymmetrical, with the result that the longitudinal axis gets so displaced as to lie eventually at right angles to the pedicel with the persistent stigma at one end, whilst the seed experiences a displacement of its parts corresponding to figs. 9 and 10. The outer integument develops into a mainly crustaceous shell, the testa; the inner assumes considerable proportions on the side opposite to the raphe and becomes of a spongy consistence, with the resultant formation of lacunae which are often large and irregular.—O. Stapf.

Fig. 1, diagram of male flower; 2, bud of male flower, very young; 3, the same, more advanced; 4, perianth of male flower with the androecium removed; 5, anther; 6, female flower; 7, perianth of female flower with the pistil removed; 8, longitudinal section of pistil; 9, mature fruit, cut open, so as to show the seed, seen from above; 10, seed seen from below, with raphe; 11, embryo surrounded by the endosperm; 12, fruit, cut open, with an abortive second ovule by the side of the seed; 13, seed, with the testa partly removed, showing the spongy tegmen; 14, aborted ovule (see fig. 12). *All enlarged.*

M.S. delt. et Lith

Tabula 3011.

PSEUDOLACHNOSTYLIS MAPROUNEAEFOLIA, *Pax.*

Euphorbiaceae. Tribus Phyllantheae.

P. maprouneaefolia, *Pax in Engl. Bot. Jahrb.* vol. xxviii. p. 20; *Hutchinson in Dyer, Fl. Trop. Afr.* vol. vi. pars 1, p. 672; affinis *P. Dekindtii,* Pax, sed foliis infra in costa tantum pubescentibus differt.

Frutex vel *arbor* parva; ramuli teretes, juniores tomentosi, demum glabri. *Folia* ovata vel ovato-elliptica, apice rotundata vel breviter obtuse acuminata, basi rotundata vel leviter cuneata, 4–7·5 cm. longa, 2·5–4 cm. lata, subcoriacea, integra, utrinque glabra costa media infra dense pubescente excepta; nervi laterales utrinsecus 6–7, intra marginem anastomosantes, infra paulo prominentes; petiolus 7–10 mm. longus, leviter verrucosus, brunneo-pubescens; stipulae caducae. *Flores* ♂ in cymas axillares pedunculatas dispositi; pedunculus 4–6 mm. longus, plus minusve dense pubescens; flores conferti, subsessiles; bracteae ovatae vel oblongae, pubescentes. *Sepala* 5, ovata, obtusa, 3 mm. longa, 2·5 mm. lata, extra pubescentia, intus glabra. *Discus* annularis, leviter verrucosus. *Staminum* columna 2 mm. longa, glabra; filamenta superne libera; antherae 6, 2 mm. longae, glabrae. *Ovarii* rudimentum parvum. *Flores* ♀ ad apices pedunculorum pauci vel solitarii; pedunculus ad 1 cm. longus, pubescens; pedicelli circiter 2 mm. longi, pubescentes. *Sepala* oblongo-lanceolata, obtusa, 5–6 mm. longa, 2·5 mm. lata, extra 5–6-nervia, pubescentia. *Discus* cupularis, lobatus, lobis dentatis, glaber. *Ovarium* dense brunneo-villosum; styli 3, basi connati, lobati, glabri, lobis recurvatis crassis. *Fructus* globosus, 2 cm. diametro; pericarpium circiter 0·5 mm. crassum, in sicco crasse verrucosum, luteum; endocarpium osseum, perdurum, luteum, fere 1 mm. crassum. *Semina* ellipsoidea, nitida, basi strophiolo lutescente instructa, longitudinaliter striata, 7 mm. longa, 4·5 mm. lata.

Tropical East Africa: German East Africa; Salanda, *Fischer,* 287; Usambiro, *Stuhlmann,* 853. Portuguese East Africa; Gazaland, Lower Umswirizwi River, *Swynnerton,* 151. Nyasaland: Shiré River, *Kirk*; Mungazi, *Kirk*; Msolo, *Buchanan,* 269; without precise

locality, *Buchanan*, 227, 409; Tanganyika, *Scott Elliot*, 8716. Rhodesia; Matoppo Hills, *Gibbs*, 276; *Rogers*, 5334; Victoria, *Monro*, 724. Bechuanaland; Palapye, *Passarge*, 90.

South Africa. The following imperfect specimens appear to belong to a more glabrescent form of this species: Transvaal; near Izaneen Estate, Zoutpansberg, *Burtt Davy*, 5560; between Thabina and Izaneen, on slope of kopje near Groot Letaba, *Burtt Davy*, 5286; Warm Baths, Waterberg district, *Burtt Davy*, 2151.

Pseudolachnostylis is a small genus of Euphorbiaceous shrubs endemic to Africa, and especially abundant in Angola and the Zambesi basin. It is distinguished in the tribe *Phyllantheae* by its shortly pedunculate cymose male inflorescences and the hard globose tardily septicidal capsules. The female flowers are axillary and solitary or subsolitary. —J. Hutchinson.

Figs. 1 and 2, male flowers; 3, androecium and rudimentary ovary; 4, part of female calyx showing the adnate disk; 5, pistil; 6, transverse section of the ovary; 7, fruit; 8, longitudinal section of seed. *All enlarged except* 7, *which is of natural size.*

M. S. delt et lith.

Tabula 3012.

DIOTHONEA LLOENSIS, *Lindl.*

Orchidaceae. Tribus Epidendreae.

D. lloensis, *Lindl. in Hook. Journ. Bot.* 1834, vol. i. p. 12 ; *Benth. Pl. Hartw.* p. 257 ; affinis *D. suavi*, Reichb. f. et Warscew., sed florum omnibus partibus fere duplo minoribus differt.

Herba epiphytica vel terrestris, 20–40 cm. alta ; caules ramosi, subteretes, foliosi, vaginis striatis persistentibus foliorum vestiti. *Folia* sessilia, lineari-oblonga, obtusa, coriacea, 5–11 cm. longa, 7–10 cm. lata, margine revoluta. *Racemi* penduli vel subpenduli, 6–11 cm. longi, multiflori ; bracteae patentes vel reflexae, subulatae, acuminatae, concavae, 4–7 cm. longae ; pedicelli graciles, 1–1·8 cm. longi. *Flores* submembranacei, verosimiliter flavescentes. *Sepala* et *petala* subpatentia, ovato-oblonga, subacuta, 1–1·2 cm. longa. *Labellum* basi cum columnae pede in cyathum latum saccatum connatum ; limbus patens vel reflexus, subinteger vel obscure trilobus, suborbicularis, obtusus vel emarginatus, undulatus, 1·2–1·5 cm. latus ; discus convexus, carinis paucis obtusis instructus. *Columna* lata, marginata, circiter 6 mm. longa, prope apicem subconstricta, basi in pedem brevem producta ; clinandrium prominens, subintegrum ; pollinia 4, cerea, ovoidea, subcompressa, uniseriata, apicibus visco parco in filum cohaerentia.

South America : Ecuador ; Valley of Lloa, western declivity of the Andes, *Hall*, 67 ; woods on the western side of Pichincha, at 2700 m., on branches of trees and on the ground, *Jamieson*, 786 ; near Quito, in woods, *Hartweg*, 1421.

Diothonea lloensis, Lindl., is the original species of an interesting little Andine genus, to which about six species are now accredited. It is closely allied to *Epidendrum*, but differs in having the column dilated below and extended into a short foot, to which the saccate base of the lip is attached and from which the limb of the same is more or less sharply reflexed ; also in the prominent almost hooded clinandrium and in the possession of a viscus connecting the pollinia. The species was first collected in the Valley of Lloa by Colonel Hall, from whose materials it was originally described by Dr. Lindley, and the subsequent gatherings by Jamieson and Hartweg were made in almost the same locality.—R. A. Rolfe.

Fig. 1, column and base of lip, showing attachment ; 2, lip, detached ; 3, column, with foot removed ; 4, apex of column, showing clinandrium and pollinia *in situ* ; 5, anther-case. *All enlarged.*

M. S. del.t et lith.

Tabula 3013.

CADALVENA DALZIELII, *C. H. Wright.*

Scitamineae. Tribus Zingibereae.

C. Dalzielii, *C. H. Wright in Kew Bulletin*, 1912, p. 195; species a *C. spectabili*, Fenzl, corollae tubo longiore tenui floribusque minoribus differt.

Herba; rhizoma breve, crassum, carnosum. *Folia* circiter 4, rosulatim disposita, explanata, suborbicularia, ad 10 cm. diametro, utrinque glabra, marginibus membranaceis rubris albo-ciliatis; nervi laterales utrinsecus 9–14, tenues; venae transversales numerosae, approximatae. *Flores* brevissime spicati; bracteae lanceolatae, 3 cm. longae, 3 mm. latae, pubescentes. *Calyx* spathaceus, breviter 3-dentatus, 3 cm. longus. *Corolla* lutea; tubus 4 cm. longus, tenuis; lobi oblongi, acuminati, 3 cm. longi, 1 cm. lati. *Labellum* luteum, 4 cm. latum, undulatum, infra cuneatum. *Antherae* 5 mm. longae; connectivum oblongum, obtusum, 2 cm. longum, 4 mm. latum. *Ovarium* 6-costatum, pubescens, 3-loculare; ovula plura.

Tropical West Africa: Northern Nigeria; Yola Province, Kilba Country, *Dalziel*, 229; Sokoto and Kontagora Provinces, *Dalziel*, 560.

The genus *Cadalvena*, Fenzl, is intermediate between *Kaempferia*, Linn., and *Costus*, Linn., with the former of which it has been united by Bentham and with the latter by Schumann. From *Kaempferia* it differs in the lateral staminodia being rudimentary or suppressed, and from *Costus* in its acaulescent habit.

Another species, *C. spectabilis*, Fenzl, which has been figured in Curtis's Botanical Magazine, t. 7992, is widely spread in the eastern half of Africa from Senaar southwards to Nyasaland, and differs from the present plant in its larger size, obovate-cuneate (more rarely suborbicular) leaves, and comparatively shorter and broader corolla-tube.

C. Dalzielii is said by Dr. J. M. Dalziel to grow all over Northern Nigeria, except in the north, but to flower only rarely. It is called in the Hausa language 'takalmin zomo' or hare's slipper.—C. H. Wright.

Fig. 1, stamen with upper portion of style; 2, stigma. *Both enlarged.*

C. Stapf anal.

Tabula 3014.

SCLERODACTYLON JUNCIFOLIUM, *Stapf.*

Gramineae. Tribus Eragrosteae.

S. juncifolium, *Stapf in Kew Bulletin*, 1911, p. 318 ; species unica.

Gramen fere totum glaberrimum. *Rhizoma* breve, radices crassas spongiosas edens. *Culmi* arctissime approximati, simplices vel parcissime ramosi, inferne compressi, superne teretes, duri, 25–50 cm. longi (spicis demptis), 2–3-nodi. *Folia* pleraque basalia ; vaginae firmae, 6–8 cm. longae, basales culmum arcte amplectentes, a latere magis minusve compressae, dorso rotundatae, laevissimae, arcte nervoso-striatae, caulinae similes, nisi subteretes ; ligulae breves, rotundato-truncatae, pubescentes ; laminae longe subulatae, cylindricae vel magis minusve compressae, ima basi canaliculatae, apice pungentes, 20–40 cm. longae, ad 2·5 mm. diametro, praeter margines partis canaliculatae asperulos laevissimae, glaberrimae. *Spicae* 2–3 ad apices culmorum digitatae, subsessiles, 5–10 cm. longae, rigidissimae, rhachi triquetra apice nuda ; pedunculi rudimentarii griseo-pubescentes. *Spiculae* dense imbricatae, ovatae vel ellipticae vel oblongae, valde variae, 7–15 mm. longae, 3–4·5 mm. latae, a latere valde compressae, 7–20-florae, stramineae, glaberrimae ; pedicelli brevissimi, scaberuli ; rhachilla tarde disarticulata, glaberrima. *Anthoecia* hermaphrodita, arcte imbricata. *Glumae* scariosae, a latere visae oblique lanceolatae, acutae vel subacutae, inferior 2–3 mm., superior 3–4 mm. longa, utraque 1-nervis, carina magis minusve asperula. *Valvae* oblique ovatae, 4·5–5 mm. longae, acutae, integrae, muticae vel mucronulatae, praeter margines hyalinos durae, 3-nerves (interdum utrinque nervo tenui addito), nervis lateralibus inferne saepe obsoletis superne prominulis, carina minute asperula. *Paleae* valvas aequantes, alato-carinatae, alis latis. *Lodiculae* late cuneatae, fere 0·75 mm. longae. *Antherae* oblongo-lineares, 2 mm. (vel ultra ?) longae. *Ovarium* glabrum, cum stylopodio 1·25 mm. longum ; styli tenuissime capillares, 1·25 mm. longi ; stigmata plumosa, fere 2 mm. longa, sub anthoecii apicem lateraliter exserta. *Caryopsis* in anthoecio maturo paulo mutato inclusa, subtriquetro-ellipsoidea, stylopodio dempto 2 mm. longa, brunnea, pericarpio tenuissimo separabili, testa tenui. *Embryo* 0·75 mm. longus, scutello elliptico basi ultra radiculam producto, epiblasto lato truncato.

Madagascar : East Coast, *Boivin*, 2291 ; Ambongo, *Pervillé*, 545 ; Lac Manampetsa, *Perrier de la Bathie*.—O. Stapf.

Fig. 1, part of a spike with empty glumes ; 2, spikelet ; 3, a valve ; 4, its palea ; 5, lodicules ; 6, pistil ; 7, embryo ; 8, longitudinal section of embryo ; 9, grain. *All enlarged.*

Tabula 3015.

LOEWIA TANAENSIS, *Urb.*

Turneraceae.

L. tanaensis, *Urb. in Engl. Bot. Jahrb.* vol. xxv. Beibl. 60, p. 2; affinis *L. glutinosae,* Urb., ramis et foliis stellato-pubescentibus floribus breviter pedicellatis differt.

Frutex parvus; rami teretes, tuberculati, leviter purpurei; ramuli juniores dense pubescentes. *Folia* obovata, cuneata, 3·5–5 cm. longa, 2–3·5 cm. lata, nisi tertia parte inferiore dupliciter crenata, tenuiter chartacea, utrinque stellato-pubescentia et glandulosa; nervi laterales utrinsecus 5–6, distincti; petioli 5–7 mm. longi, pubescentes. *Flores* solitarii, axillares; pedicelli circiter 3 mm. longi, dense pubescentes; prophylla ovata vel ovato-oblonga, pinnatifida vel pinnatisecta, usque ad 5 mm. longa, tomentosa, lobis linearibus vel oblongo-linearibus. *Calycis* tubus cylindricus, circiter 1 cm. longus, extra tomentellus; lobi 5, oblongo-lanceolati, obtusi, 5–7 mm. longi, 2–2·5 mm. lati, pubescentes. *Petala* 5, obovata, apice rotundata, circiter 10 mm. longa, 6 mm. lata, glabra. *Filamenta* calycis tubi basi adnata, gracilia, glabra; antherae vix exsertae, 2 mm. longae. *Ovarium* oblongum, 5 mm. longum, apice contractum, pubescens; styli 3, graciles, exserti, glabri, apice capitati. *Capsula* ovoideo-lanceolata, circiter 1 cm. longa, molliter tomentella. *Semina* oblongo-obovata, leviter arcuata, utrinque obtusa, 4 mm. longa, 1·5 mm. crassa, conspicue favosa, hilo subgloboso, arillo oblongo albo margine lacerato instructa.

Tropical East Africa: British East Africa; Tana River, *F. Thomas,* 48 in itin. Denhardtiano; *Battiscombe,* 522.

The stellately pubescent branches and leaves serve to distinguish *L. tanaensis* from *L. glutinosa,* Urb., the other known species of this small Turneraceous genus; the former species occurs at an altitude of about 300 m. in the neighbourhood of the Tana River, British East Africa, and the latter in Somaliland.—J. Hutchinson.

Fig. 1, longitudinal section of flower; 2, anthers; 3, pistil; 4, transverse section of ovary; 5, seeds; 6, longitudinal section of seed; 7, embryo. *All enlarged.*

M. S. del^t et lith.

Tabula 3016.

EUGENIA PUSILLA, *N. E. Brown.*

Myrtaceae. Tribus Myrteae.

E. pusilla, *N. E. Brown in Kew Bull.* 1912, p. 276; *Dümmer in Gard. Chron.* 1912, vol. lii. p. 192, fig. 88; affinis *E. albanensi*, Sond., cui habitu simillima, sed foliis anguste lineari-lanceolatis facile distinguenda.

Herba perennis, 10–15 cm. alta; caules annui, fasciculati, erecti, graciles, 0·6–0·7 mm. crassi, glabri. *Folia* opposita vel alterna, suberecta vel leviter patula, brevissime petiolata, 2–3·5 cm. longa, 2–3 mm. lata, anguste lineari-lanceolata, acuta, basi attenuata, uninervia, pellucido-punctata, marginibus revolutis, glabra. *Flores* solitarii, ex axillis foliorum inferiorum enati, omnino glabri; pedicelli 1–2 cm. longi, graciles, apice bibracteati; bracteae 2 mm. longae, lineares, recurvae. *Sepala* 4, 2 mm. longa, latissime ovata, acuta. *Petala* 5 mm. longa, 3 mm. lata, late ovata, obtusa, minute denticulata, breviter unguiculata. *Stamina* 3·5 mm. longa, incurva. *Ovarium* breviter obconicum.

South Africa: Transvaal; near Amsterdam, in Ermelo district, *Forbes.*

This species belongs to a small group of which all the members are of very dwarf habit and produce annual stems from a perennial root-stock. They are so different in general appearance from the other species of *Eugenia* that, until the flowers are examined, they could scarcely be suspected to belong to that genus. *E. pusilla* bears the local name 'lomo' and in the Ermelo district is suspected to be poisonous to sheep.

Var. **latior,** *Dümmer in Gard. Chron.* 1912, vol. lii. p. 193; *folia* 4–5 mm. lata.

South Africa: Natal; without precise locality, *Gerrard*, 1645.

This specimen is in very young fruit and not improbably is only a more luxuriant specimen of the typical plant.—N. E. Brown.

Fig. 1, part of a leaf, showing the revolute margins; 2, a flower; 3, ovary and style, with two sepals and the remains of the stamens; 4, a petal; 5, stamens. *All enlarged.*

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M.S.delt et lith.

Tabula 3017.

DOBERA ALLENII, *N. E. Brown.*

Salvadoraceae.

D. Allenii, *N. E. Brown in Kew Bull.* 1914, p. 80 ; affinis *D. loranthifoliae,* sed foliis latioribus, petalis obtusioribus, tubo stamineo subduplo breviore apice inter filamenta dentato, antheris haud apiculatis et stylo duplo longiore differt.

Arbor magna, cortice ramorum cinereo. *Folia* opposita, glabra ; petiolus 5–8 mm. longus ; lamina 4·5–7·5 cm. longa, 2·2–4·5 cm. lata, lanceolata, ovata vel elliptica, obtusa vel subacuta, basi obtusa vel late rotundata, subtrinervia. *Paniculae* axillares, foliis breviores, 2–5 cm. longae, 2·5–6 cm. latae, ramis oppositis vel alternis minute tomentosis. *Flores* sessiles, oppositi vel subopppositi. *Calyx* 2–2·3 mm. longus, subcampanulato-tubulosus, apice breviter et obtuse 4-dentatus, minutissime tomentosus. *Petala* 4, erecta, 3 mm. longa, 1·5 mm. lata, elliptica vel lanceolata, subacuta, glabra. *Glandulae* disci 4, magnae. *Tubus stamineus* 1·6 mm. longus, apice inter partes liberas 0·25 mm. longas filamentorum minute dentatus ; antherae erectae, 1 mm. longae, deltoideo-ovatae, subobtusae nec apiculatae, basi cordatae. *Ovarium* cum stylo vix 2 mm. longum. *Fructus* immaturus, ovoideus, subacutus, calycem longe excedens.

Tropical East Africa : Portuguese East Africa ; Antari, *Allen,* 95.

The small genus *Dobera,* although undoubtedly allied to *Salvadora,* shows some affinity with the genera *Aptandra* and *Ongokea* in Olacineae, agreeing with those genera in its free petals, stamens united into a tube, and the four large glands outside the staminal tube, but differing in its opposite leaves, tubular calyx, anthers and ovulation. Specifically *D. Allenii* is very similar to *D. loranthifolia,* Warb. and might be mistaken for it, but when the flowers are examined it is at once distinguished by having a very much longer staminal tube, with teeth between the very short free part of the filaments, no apiculus to the anthers, and a very much longer style.—N. E. Brown.

Fig. 1, flower ; 2, flower with part of the calyx and two petals removed, showing the staminal tube and two of the glands outside it ; 3, staminal tube, laid open ; 4, anthers ; 5, longitudinal section of the ovary. *All enlarged.*

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M. S. delt. et lith.

Tabula 3018.

DISCHIDIA MICHOLITZII, *N. E. Brown.*

Asclepiadaceae. Tribus Marsdenieae.

D. Micholitzii, *N. E. Brown in Kew Bull.* 1913, p. 357; affinis *D. acuminatae,* Cost., sed foliis ellipticis vel elliptico-ovatis abrupte acuminatis basi rotundatis, umbellis pedunculatis et coronae lobis bifidis conspicue differt.

Caulis volubilis, gracilis, minutissime et sparse adpresse puberulus, fusco-purpureus, internodiis 2–6 cm. longis. *Ascidia* nulla. *Folia* opposita; petiolus 3–5 mm. longus, 1–5 mm. crassus, puberulus; lamina 2·5–3·8 cm. longa, 1·7–2·7 cm. lata, elliptica vel elliptico-ovata, apice abrupte acuminata, basi rotundata, carnosa, supra plana, subtus leviter convexa, glabra, viridis, plus minusve sordide purpureo-tincta. *Umbellae* axillares, multiflorae; pedunculi 5–8 mm. longi, glabri; bracteae minutissimae, dentiformes; pedicelli 3–3·5 mm. longi, glabri. *Calyx* 5-lobus, glaber; lobi 1·5 mm. longi, ovati, obtusi. *Corolla* 6–6·5 mm. longa, urceolata, extra glabra, intus fauce barbata; tubus basi ovoideo-inflatus, 3·5 mm. diametro, carneus, purpureo-vittatus; lobi breves, erecti, acuti, virides. *Coronae* lobi erecti, albi, subhyalini, 1 mm. longi, bifidi, lobis incurvo-recurvatis subellipticis obtusis canaliculatis. *Staminum columna* 2 mm. longa, conica, fusco et luteo-variegata, glabra.

India: Manipur; 2700 m., *Meebold,* 6732.

Indo-China: Upper Burma; Maymyo Plateau, 1000 m., *Lace,* 6261; without precise locality, *Micholitz.*

This interesting species has been described and figured from a living plant sent by Mr. Micholitz to the firm of Messrs. F. Sander and Sons, by whom it was presented in 1913 to Kew, where it flowered on May 14 of that year. When originally described the locality was not definitely known, but was believed to be Burma, a surmise which has since been confirmed.—N. E. Brown.

Fig. 1, flower; 2, part of a corolla, laid open; 3, corona and staminal column; 4, a lobe of the corona; 5, pollinia. *All enlarged.*

Tabula 3019.

CROTONOGYNE ANGUSTIFOLIA, *Prain.*

EUPHORBIACEAE. Tribus CROTONEAE.

C. angustifolia, *Prain in Kew Bull.* 1912, p. 103, *nec Pax*; species foliis parvis a ceteris generis ejus plane recedens, proxime tamen *C. lasiocarpae*, Prain, ob ovarium dense setosum ponenda.

Frutex 5–6-metralis, ramis foliisque glabris. *Folia* alterna, sparsa, breve petiolata, coriacea, anguste lanceolata, obtusa vel subacuta, versus basin acutam attenuata, margine integra, glabra, 10 cm. longa, 1–1·25 cm. lata, supra saturate viridia, subtus pallidiora, haud lepidota; nervi laterales utrinsecus ultra 20 sed obscuri; petiolus parce stellato-puberulus, haud lepidotus, 5–6 mm. longus; stipulae ovato-lanceolatae, acutae, 4 mm. longae, stellato-puberulae, haud lepidotae, cito glabrescentes. *Racemi* ad 24 cm. longi, simplices; rhachis glabra; flores masculi glomerati, glomeruli pauciflori; feminei versus apicem rhachidis solitarii; pedicelli masculi brevissimi, feminei 8 mm. longi, stellato-pubescentes, haud lepidoti; bracteae 2-glandulosae. *Calyx* maris globosus, in alabastro glaucus, demum valvatim 2-lobus, extra stellato-puberulus. *Corolla* alba, gamopetala, calyce longior, tubo late campanulato, intus hirsuto, limbo alte 5-lobo, lobis orbicularibus. *Stamina* circiter 12, exteriora 5, glandulis extra staminalibus liberis sed contiguis circumcincta. *Calyx* feminei oblongus, stellato-puberulus, haud lepidotus, 4 mm. longus; lobi 5, anguste oblongi, obtusi, eglandulosi. *Petala* 5, alba, imbricata, calyce distincte longiora. *Discus* subinteger. *Ovarium* pilis simplicibus rigidis dense setosum; styli 3, singuli 4-partiti.—*Manniophyton angustifolium*, Baill. in Bull. Soc. Linn. Paris, vol. ii. p. 952 (1891). *Crotonogyne parvifolia*, Prain, l.c. 102 (1912), *et* in Dyer, Fl. Trop. Afr., vol. vi. pars 1, p. 824 (1912). *Neomanniophyton angustifolium*, Pax in Engl. Pflanzenr.—Euphorb. Acalyp. Chrozophor. p. 120 (1912).

TROPICAL WEST AFRICA: Lower Guinea; Gaboon, Ogowe, *Thollon.*, 134, 361, 769.

This *Crotonogyne* is very distinct in appearance from the other species of its genus, though in floral structure it agrees well with its

congeners. The difference in habit is largely due to the conditions under which it grows. Like *Homonoia riparia*, Lour., an Asiatic member of the same natural family, it is to be found only on rocks in river-beds which are completely submerged when the rivers are in flood. The transfer of the species from *Manniophyton*, a genus in which the leaves are palmately lobed, to *Crotonogyne*, which is its legitimate place, unfortunately precludes the continued use of the name *C. angustifolia* bestowed by Dr. Pax in 1894 upon another and very different Gaboon *Crotonogyne*.—D. Prain.

Fig. 1, base of leaf, with glands, and petiole ; 2, a male flower ; 3, stellate hairs from male calyx ; 4, portion of male corolla, seen from inside ; 5, androecium ; 6, a female flower ; 7, stellate hair from female pedicel ; 8, a single petal from female flower ; 9, pistil ; 10, transverse section of ovary. *All enlarged.*

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Tabula 3020.

ASCOLEPIS GRACILIS, *Turrill.*

CYPERACEAE. Tribus HYPOLYTREAE.

A. gracilis, *Turrill*; species nova flore seta posteriore 1 mm. longa instructo valde distincta.

Planta annua, caespitosa. *Culmi* erecti, usque ad 13 cm. alti, graciles, teretes, glabri, straminei. *Folia* linearia, subtriquetra, apice obtusa, usque ad 8 cm. longa, 0·5 mm. lata, glabra. *Inflorescentia* capitata, usque ad 8 mm. longa, 5 mm. diametro; bracteae 3, inaequales, circiter 5 mm., 3 mm., et 0·75 mm. longae, foliis similes. *Glumae* inferiores usque ad 1·75 mm. longae, 1 mm. latae, acuminatae; glumae superiores 2·75 mm. longae, 0·5 mm. latae, apice longe acuminatae, alis nucem involventibus; setae posteriores 1 mm. longae. *Stamina* in quoque flore solitaria vel duo, filamentis 1 mm. longis. *Stylus* cum ramis tribus 0·5 mm. longis 1 mm. longus. *Nux* trigona, 0·75 mm. alta, 0·3 mm. diametiens, grisea.—*Scirpus squarrosus*, Linn., var. *siamensis*, C. B. Clarke ex Hosseus in Bot. Centralb. 1910, 2, vol. xxvii. p. 460. *Ascolepis* sp. n., Turrill ex Craib in Kew Bulletin, 1912, p. 425.

INDO-CHINA: Siam; Chiengmai, Doi Sootep, in marshy ground by a stream, 540 m., *Kerr* 2261; Wang Djao, *Hosseus* 101.

TROPICAL WEST AFRICA: Nigeria; Nupe, *Barter* 761, pro parte.

The diagnosis here published has been drawn up from Kerr's Siamese plants, but the West African specimens collected by Barter only differ in having slightly smaller nuts and in having the inflorescence in most cases composed of from three to five sessile heads. In one at least of Kerr's specimens the writer has seen an indication of a trifid head and in the larger specimens collected by Dr. Hosseus the heads are distinctly three-lobed. A few of the heads in Barter's specimens are quite simple and solitary.

It is difficult to suggest any explanation of the curious geographical distribution of this plant. It is undoubtedly a native of Siam. At the same time the only reason for thinking that there may have been some mistake in connection with the plants supposed to have been

collected by Barter resides in the circumstance that there are two sheets of Barter 761 at Kew and that one of these sheets has two plants belonging to distinct genera pasted on it. The unmixed sheet is the type of *Ascolepis pusilla*, Ridley (Trans. Linn. Soc. ser. 2, vol. ii. p. 164), and has only plants of that species mounted on it. The other sheet contains plants of two species which have been named respectively *Lipocarpha microcephala*, R.Br. and *Scirpus squarrosus*, Linn. by the late Mr. C. B. Clarke. Neither name is correct; the plants named *Lipocarpha microcephala* are *Ascolepis pusilla*, Ridl. and were probably collected at the same time as the plants on the other sheet of the same number, while the plants named *Scirpus squarrosus*, Linn. are *Ascolepis gracilis*, Turrill, described above.—W. B. Turrill.

Fig. 1, flower with bristle and piece of the axis; 2, portion of the axis with bristles still attached; 3, lower glume; 4, upper glume; 5, gynaecium; 6, lower glume; 7, upper glume enclosing nut; 8, upper glume with its wings spread out; 9, nut. *All enlarged.*

M.S. del^t et lith

Tabula 3021.

BERBERIS HOLSTII, *Engl.*

BERBERIDACEAE. Tribus BERBERIDEAE.

B. Holstii, *Engl. Pflanzenw. Ost-Afr.* vol. C, p. 181 (1895) ; bracteis inferioribus foliaceis distincta.

Frutex ramis annotinis angulatis sulcatis glabris superne rubellis inferne fulvis nigro-punctatis. *Spinae* trifidae cruribus lateralibus sub angulo recto patentibus, validae, cinnamomeae, subtus valde excavatae, crure intermedio ad 2·5 cm. longo, cruribus lateralibus ad 1·5 cm. longis ; vagina conspicua, 3–4 mm. longa, apice in stipulas subulatas ad 1·5 mm. longas producta. *Ramuli abbreviati* inflorescentias singulas (vel rarius binas) basi foliis circiter 9 cinctas gerentes. *Folia* supra vaginam articulata, oblanceolata, 3–4 cm. longa, 9–13 mm. lata, spinuloso-mucronata, integra vel spinuloso-dentata spinulis utrinsecus 1–3, coriacea, glabra, exsiccando fulva, subtus pallidiora, nervis lateralibus obliquis supra inconspicuis subtus leviter elevatis ; vagina ad 2 mm. longa, apice in stipulas subulatas 1–1·5 mm. longas producta. *Racemi* compositi, arcuati, ad 5 cm. longi ; rhachis rubra, angulata ; bracteae inferiores 1–2 foliaceae, supra vaginam circiter 2 mm. longam articulatae, 1·5–3 cm. longae, supra conspicue reticulatae, stipulis subulatis ; bracteae superiores triangulares, acuminatae, marginibus inflexis, ad 4·5 mm. longae, ad 1·8 mm. latae ; pedicelli 5–7 mm. longi. *Bracteolae* (seu sepala extima) triangulari-ovatae, 2–2·5 mm. longae, medio incrassatae, obsolete dentatae. *Sepala* exteriora ovata, 3·5–4 mm. longa ; sepala interiora obovata, valde convexa, 6 mm. longa. *Petala* obovata, valde concava, 6 mm. longa, glandulis circiter 1 mm. supra basin petalorum sitis oblongo-linearibus circiter 1 mm. longis interdum bifurcatis vel trifurcatis (venas petalorum sequentibus). *Stamina* 4·5–5 mm. longa ; filamenta 2·5–2·7 mm. longa, paullo ultra medium angustata ; connectivum 0·5–0·7 mm. supra loculos productum, rotundatum vel apiculatum. *Pistillum* 5 mm. longum, breviter stipitatum ; stigma 1·6 mm. diametro ; ovula 4–5. *Baccae* ellipsoideae, maturae haud visae.

TROPICAL EAST AFRICA : British East Africa ; Mt. Kenia, 2700–3000 m., *Battiscombe,* 92 : Mr. Battiscombe states that he saw the

same species on the Mau at a similar altitude. German East Africa; Usambara, Kwai, 1700 m., *Eick*.

The above description has been drawn up exclusively from Battiscombe's specimen, which has also served as the type of the plate. Eick's Usambara specimen* has smaller, less coriaceous leaves with more numerous teeth, but seems to belong to the same species. A striking and apparently constant character of *B. Holstii*, which is shown in the raceme next to fig. 5 of the plate, is that the lowermost one or two bracts are foliaceous, rather smaller than the leaves and with more pronounced nervation, but otherwise similar, possessing a distinct vagina and adnate stipules. The lamina is sometimes considerably reduced, in one case practically to the midrib, so that it becomes subulate, but the vagina and stipules are hardly altered. The upper bracts are triangular, acuminate, under 0·5 cm. in length, and have neither vagina nor stipules.

Only two species of *Berberis* are known from Tropical Africa, and one from Arabia. *B. Petitiana*, C. K. Schneider,† from Abyssinia, possesses the same foliaceous bracts as *B. Holstii*, and may have to be united with it when better known. *B. Forskaliana*, C. K. Schneider, a native of Yemen, appears to be specifically distinct, but its flowers are not yet known.

The genus *Berberis* apparently originated in the Northern Hemisphere, and has penetrated southwards in America, Africa and Asia as far as Tierra del Fuego, Usambara and the Malay Archipelago respectively. —T. A. Sprague.

Fig. 1, base of a foliaceous bract, showing the articulation of the lamina with the vagina: the blunt appearance of the stipules is due to the upper subulate part having been broken off; 2, flower; 3, the same, expanded; 4, petal and stamen; 5, petal; 6, stamen; 7, pistil; 8, longitudinal section of pistil. *All enlarged.*

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* It has not been possible to examine the type, which was collected in Usambara by Holst, but Eick's specimen has been identified as *B. Holstii* in the Berlin Herbarium.

† Bull. Herb. Boiss. sér. 2, vol. v. p. 455.

M. S del.ᵗ et lith.

Tabula 3022.

KERMADECIA VITIENSIS, *Turrill.*

Proteaceae. Tribus Grevilleae

K. vitiensis, *Turrill*; species nova affinis *K. ellipticae,* Brongn. et Gris, sed foliis omnibus pinnatis, inflorescentia graciliore, floribus minoribus saepissime 2 sessilibus ad apicem pedicellorum connatorum sitis praecipue recedit.

Arbor, ramis teretibus minute ferrugineo-puberulis indistincte longitudinaliter lineatis. *Folia* omnia aut pari- aut impari-pinnata, usque ad 24 cm. longa et 17 cm. lata; petiolus teres, 3–5 cm. longus, leviter puberulus vel fere glaber; foliola circiter 8, alterna vel opposita late lanceolata, apice subobtusa, basi saepe obliqua, rotundata vel acuta, usque ad 10·5 cm. longa et 4 cm. lata, integra vel apicem versus dentibus duobus instructa, matura supra nitentia, infra opaca, nervis lateralibus utrinsecus circiter 5 sursum valde curvatis cum costa pagina utraque prominentibus, nervis transversis uti reticulatione prominentibus. *Paniculae* 5–15, ramulorum apicem versus dispositae, multiflorae; pedunculi teretes, 2–3·5 cm. longi, ferrugineo-pubescentes; pedicelli singuli vel saepissime bini ad summum apicem connati, 0·5 cm. longi, ferrugineo-pubescentes; bracteae minutissimae. *Perianthii* lutei tubus cylindricus, leviter obliquus, 8 mm.–1 cm. longus, medio 1 mm. diametro, basi dilatatus, 1·75 mm. diametro, extra ferrugineo-puberulus, intus glaber; limbus ovoideus, segmentis 4 per anthesin solutis, laminis ovatis concavis 2·5 mm. longis 1·5 mm. latis extra ferrugineo-puberulis intus glabris. *Antherae* 4, in lamina subsessiles, oblongae, 2·25 mm. longae, 0·5 mm. latae, connectivo latiusculo apice breviter apiculato. *Discus* hypogynus, semiannulatus, unilateralis, 1 mm. altus, carnosus, glaber, breviter bilobatus. *Ovarium* cylindricum, in receptaculo obliquo subsessile, 2·5 mm. altum, 0·5 mm. diametro, glabrum, ovulis 2 collateralibus a loculi apice pendulis; stylus 6 mm. longus, glaber; stigma clavatum, 1·5 mm. longum, obliquum.

Polynesia: Fiji; Nandarivatu, in flower March 14th, 1906, *im Thurn,* 149.

The plant figured and described above is one of the most interesting of the species represented in a collection made in Fiji by Sir Everard im Thurn, when Governor of the group. The accompanying field-note is :—' Yellow-flowered tree in the jungle beyond the tennis court. Very conspicuous.'

This is the first member of the natural family Proteaceae to be recorded from Fiji ; it also extends the known distribution of the family in an easterly direction.

The genus *Kermadecia* is a small one, till now believed to include only five species, four endemic in New Caledonia, one in Queensland. The present plant is distinguished from all previously described species by having most of the pedicels connate in pairs to their apices and all the leaves distinctly pinnate. *K. austro-caledonica*, Benth. et Hook. f. (Adenostephanus austro-caledonica, *Brongn. et Gris*) from New Caledonia has, according to the original description, the pedicels completely connate in pairs, but the leaves are simple and very unlike those of the Fiji plant. *K. elliptica*, Brongn. et Gris, has the leaves sometimes simple sometimes compound, but even when compound the leaflets are different in shape, texture and size from those of *K. vitiensis*, and the inflorescence is distinct with simple pedicels. The two remaining New Caledonian species (*K. sinuata*, Brongn. et Gris and *K. rotundifolia*, Brongn. et Gris) have simple leaves, while the Australian *K. Bleasdalei*, Benth. et Hook. f., has compound leaves with serrated leaflets and short racemes with nearly sessile flowers.—W. B. Turrill.

Fig. 1, a pair of flower-buds ; 2, a single open flower ; 3, upper portion of a perianth segment with stamen ; 4, a pair of of pistils, *in situ*, the perianth removed ; 5, longitudinal section of a pistil. *All enlarged.*

M.S.del. et lith.

Tabula 3023.

ENTANDROPHRAGMA CAUDATUM, *Sprague.*

Meliaceae. Tribus Swietenieae.

E. caudatum, *Sprague in Kew Bull.* 1910, p. 180 ; species foliolis caudatis distincta.

Arbor 9–20 m. alta, trunco ambitu ad 2 m. *Rami* patuli, versus apices penduli, parte juniore dense ferrugineo-pilosa demum glabrescente, cortice cinereo. *Cicatrices foliorum* depresso-cordiformes ad suborbiculares, cicatricibus tribus fasciarum notatae. *Folia* 4–8-juga, 15–25 cm. longa, petiolo 4–8 cm. longo rufo-pubescente incluso, petiolulis pubescentibus vel puberulis 0·8–2·5 cm. longis gracilibus ; foliola ovata, acutissime caudato-acuminata, basi inaequalia, 3–7 cm. longa, 1·2–3 cm. lata, chartacea, juventute marginibus dense paginis sparse pilosa, demum nervo medio subtus puberulo excepto glabra, utrinque superne manifestius reticulata, nervis lateralibus patulis circiter 8-jugis superioribus minimis exclusis ; rhachis internodiis 2–3 cm. longis, supra par supremum foliolorum circiter 1 cm. producta. *Thyrsi* plures, axillares, angusti, 10–13 cm. longi, densiuscule pilosi. *Calyx* patellaris, extra dense pilosus, ultra medium 5-lobatus, lobis late ovatis circiter 0·7 mm. longis. *Petala* obovato-oblonga, concava, 5–6 mm. longa, apice inflexa, extra pilosa, intus superne parce pilosa. *Tubus staminalis* 3 mm. longus, extra glaber, intus praeter trientem superiorem dense pubescens, apice inconspicue 10-lobatus lobis brevissimis subtruncatis ; filamentella vix 0·2 mm. longa ; antherae ovoideae, circiter 0·8 mm. longae, obtuse apiculatae. *Pistillum* in disco stipitiformi dense piloso circiter 0·6 mm. alto insidens ; ovarium ovoideo-globosum, 5-lobatum, circiter 1·3 mm. altum, glabrum, 5-loculare ; stylus circiter 1 mm. longus, stigmate peltato circiter 1 mm. diametro ; ovula in quoque loculo 6, biseriata seriebus imbricatis. *Capsula* pendula, subcylindrica, 14–19 cm. longa, utrinque leviter angustata, medio 3–4·5 cm. diametro, ab apice dehiscens ; valvae medio 2·3–2·8 cm. latae, 3·5 mm. crassae, extra brunneae, dense lenticellatae, intus nitidulae ; columna vix vel paullo ultra semina suprema producta, acutiangulata, foveis seminum medio linea undulata percursis. *Semina* pro loculo ad 6, 6–10·5 cm. longa, corpore sub-

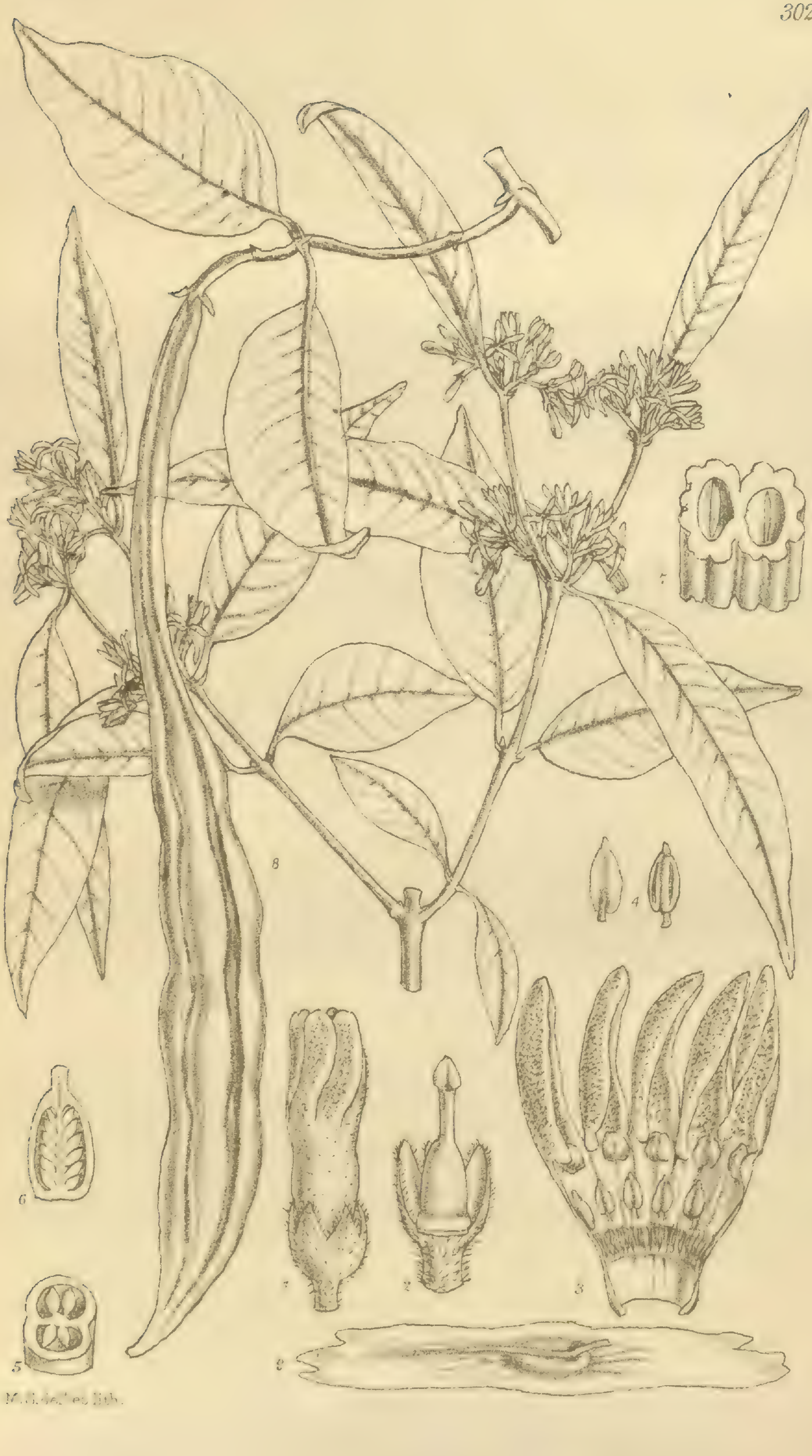
quadrato 1·7–2 cm. lato et paullo breviore, ala circiter 2 cm. lata apice rotundata. *Cotyledones* oblique ellipticae, 1·5–2·2 cm. longae, 1·1–1·4 cm. latae.—*Pseudocedrela caudata*, Sprague in Kew Bull. 1908, p. 163.

Tropical East Africa: Northern Transvaal; Zoutpansberg, Blauwberg, 1100 m., *Baily in Transvaal Colon. Herb.*, 2926. Portuguese East Africa; Mozambique, in poor sandy soil near watercourses in flat savannah country near the Madanda Forest, *Dawe*, 431.

In the Northern Transvaal, where it bears the native name 'muchuss,' *Entandrophragma caudatum* is a tree about 30 feet high. In Mozambique, however, where it is known as 'mazozo,' it attains a height of 60 feet, and the trunk a circumference of 6–7 feet. According to Mr. Dawe's notes made in the field it appears however to be somewhat rare.

The caudate-acuminate leaflets distinguish *E. caudatum* from the other species. According to the classification adopted in Engler & Prantl, Die Natürlichen Pflanzenfamilien, *E. caudatum* should be referred to the genus *Wulfhorstia*, on account of having only 6 ovules in each loculus, and no partitions inside the staminal tube. *Entandrophragma* has 8 or more ovules in each loculus, and the basal portion of the staminal tube is joined to the disk by means of 10 thin partitions. These partitions are very short, however, in *E. speciosum*, Harms, so that the generic difference between *Entandrophragma* and *Wulfhorstia* practically vanishes: the presence of 3 ovules in each row instead of 4 or more being hardly a generic character. *Wulfhorstia* may be retained, however, as a section of *Entandrophragma*, comprising *E. spicatum*, Sprague (*Wulfhorstia spicata*, C. DC.), *E. ekebergioides*, Sprague (*W. ekebergioides*, Harms) and *E. caudatum*.—T. A. Sprague.

Fig. 1, flower; 2, the same, petals removed; 3, pistil, disk and interior of staminal tube; 4, longitudinal section of pistil and disk; 5, transverse section of ovary; 6, capsule; 7, seed; 8, body of seed, and embryo; 9, lower part of a cotyledon, with radicle and plumule. *All enlarged except* 6 *and* 7, *which are of natural size.*



M.H.del.et lith.

Tabula 3024.

PLECTANEIA ELASTICA, *Jum. et Perr.* [1–6], *et* P. THOUARSII, *Roem. et Schult.* [7-9].

Apocynaceae. Tribus Echitideae.

P. elastica, *Jum. et Perr. in Le Caoutchouc et la Gutta Percha,* 15 Févr. 1908 (impr. sep. p. 9) et 15 Juin 1908 (pp. 4–14); *in Ann. Mus. Col. Marseille,* sér. 2, vol. vi. pp. 56–64, fig. 6A, 7, 8 et tab. ii.; affinis *P. Hildebrandtii,* K. Schum., sed foliis minoribus basi haud rotundatis, nervis paucioribus multo magis distinctis diversa.

Frutex scandens, ramulis tenuibus primo minutissime puberulis, deinde glabrescentibus cortice brunneo vel fuscescenti tectis, lenticellis ut videtur nullis. *Folia* varia, plantae juvenilis (teste *Jumelle*) anguste lanceolata, utrinque acuta, 8–15 mm. longa, 3–3·5 mm. lata nisi nonnulla ovato-lanceolata, 15 mm. longa, 7 mm. lata, plantae adultae in eodem ramo florente ab anguste-lanceolato ad ovatum variantia, acute acuminata vel breviter acuta, basi semper breviter acuta, 3–5 cm. longa, 0·5–1·2 cm. lata (vel teste *Jumelle* ad 6 cm. longa, 3 cm. lata), tenuiter coriacea, glabra, pallide viridia, nervo medio tenui supra canaliculato subtus prominente, lateralibus tenuissimis utrinsecus 6–10 secundum marginem arcuatim connectis; petiolus gracilis, 2–4 mm. longus. *Inflorescentiae* parvulae, cymosae, terminales, plerumque ternatae, centralis breviter pedunculata et 2 alares pedunculo circiter 2 cm. longo suffultae, saepe ad cymarum bases folium solitarium anguste lanceolatum gerentes, tenuiter pubescentes; bracteae ovatae, acuminatae, 0·5–0·75 mm. longae; pedicelli 1–2 mm. longi. *Sepala* ovata, acuta, 1 mm. longa, pubescentia. *Corolla* flavescens, extra papillis albis farinosa; tubus 1·5 mm. longus, infra medium constrictus et intus annulo pilorum munitus, apice in annulum carnosum incrassatus ore angustissimo; limbi lobi anguste oblongi, obtusi, 2·5 mm. longi. *Antherae* ovatae, apiculatae, filamentis brevibus supra pilorum annulum insertis insidentes. *Ovarium* glabrum, sepalis aequilongum; stylus brevis; stigma conicum. *Folliculi* (ex *Jumelle*) 10–30 cm. longi, 5 mm. diametro. *Semina* generis, bialata.

Madagascar: Boina; forest of Analamahitso, 800–900 m.; Firingalava, 800–900 m., *Herb. Perrier de la Bathie.*

P. Thouarsii, *Roem. et Schult. Syst.*, vol. iv. p. 420; *A DC. in DC., Prodr.* vol. viii. p. 324; *Baillon, Hist. Pl.* vol. x. p. 183; *K. Schum. in*

Engl. & Prantl, Nat. Pflanzenfam. vol. iv. pars 2, p. 144 ; *Hochreutiner in Ann. Cons. et Inst. Bot. Genève*, 1908, pp. 87, 88, fig. 7 ; *Jum. et Perr. in Ann. Mus. Col. Marseille*, sér. 2, vol. vi. pp. 35–42, pro parte saltem ; a *P. elastica*, Jum. et Perr., differt glabritie, foliis obtusiusculis vel saepius obtuse acuminatis, magis coriaceis exsiccando fuscescentibus, sepalis coriaceis obtusis praeter ciliola glabris, corolla paulo longiore.

Frutex scandens, ramulis tenuibus ut tota planta glabris cortice brunneo tectis. *Folia* elliptica vel ovato-elliptica, obtusiuscula vel saepius in acumen breve obtusum producta, 3·5–4 cm. longa, 1·2–2 cm. lata, coriacea, exsiccando fuscescentia, supra nitidula, nervo medio supra canaliculato, subtus prominente, nervis lateralibus plane obscuris ; petiolus 3–5 mm. longus. *Inflorescentiae* terminales multiflorae, corymbosae, 2·5–8 cm. (ex *Hochreutiner*) latae, pedunculo circiter 1·5 cm. longo suffultae ; bracteae ovatae, acutae, minutae ; pedicelli tenues, 1–3 mm. longae. *Sepala* ovata, obtusiuscula, 0·75 mm. longa, albo-ciliolata, caeterum glabra. *Corolla* extra praeter basin papillis albis farinosa ; tubus 2·5–3 mm. longus, ad medium constrictus et intus supra constrictionem annulo pilorum notatus ; limbi lobi oblongo-lineares, obtusi, 2·5–3 mm. longi. *Antherae* ovatae, acute acuminatae, filamentis brevissimis supra pilorum annulum insertis insidentes. *Ovarium* glabrum, stylo aequilongo ; stigma conicum. *Folliculi* inter semina paululo constricta, 15 cm. vel ultra longi, 5 mm. lati, dorso sulcati. *Semina* ad 2 cm. longa, alis ad 8 mm. longis 2·5 mm. latis.

Madagascar : without precise locality, *Petit Thouars* ; District of Vatomandry, *Guillot*, 45 ; Boina, Analamahitso and Firingalava, *Herb. Perrier de la Bathie.*

The branches figured on t. 3024 were received at Kew as representing the flowering and fruiting states of *Plectaneia elastica*, Jum. et Perr. As the result of a complete revision of the Kew material of *Plectaneia* and of the literature relating to the genus it has, however, become evident that the two branches belong to as many distinct species. *P. elastica* in fruit was described and figured by Professor Jumelle and M. Perrier de la Bathie, and there being no fruiting specimen at Kew, that part of the description which relates to the fruit is based upon their account. According to these authors *P. elastica* also occurs in South-Eastern Madagascar, in the hinterland of Fort Dauphin, where it is known as 'vahyvanda,' the Boina name being 'piraovaovao.'

In the case of *P. Thouarsii*, there are at Kew two sheets of fruiting specimens, collected by the Rev. R. Baron in 'Central Madagascar,' which the writer has no hesitation in referring to the species as defined by Roemer and Schultes. The follicles of Baron's specimens are 20–23 cm. long and about 7 mm. wide, and

the seeds up to 26 mm. long. Professor Jumelle and M. Perrier de la Bathie have drawn up their description of *P. Thouarsii* in the Annals of the Colonial Museum at Marseille from specimens which were obtained from the Upper Isandzano, a tributary of the Ikopa River draining Central Madagascar; these specimens they have found to match with some specimens of Boivin's. Their leaves are considerably larger than those of Petit Thouars' plant and their venation is said to be 'bien visible en dessous.' The inflorescence and the flowers, including the corolla, are described as slightly pubescent, and the corolla lobes as somewhat shorter than the tube and rather broad. In view of the differences indicated, some element of uncertainty as to the identity of their plant with that of Petit Thouars still remains. The plant collected by Guillot, on the other hand, has been compared and identified by M. Hochreutiner with the plant of Thouars, which is the basis of the description drawn up by Hochreutiner.

Baillon in Histoire des Plantes, l.c., says of *Plectaneia*, of which he knew but one species, viz. *P. Thouarsii*, 'fauce squamulis 5 cum staminibus alternantibus subobturata.' Such scales or tubercules are shown in fig. 3 of this plate. But sections made through the corollas of *P. Thouarsii* as well as *P. elastica* show that the walls of the tube increase in thickness towards the mouth and then project inwards so as to form a fleshy ring surrounding a minute orifice. If a dried corolla be softened in hot water, then opened and flattened out, this ring usually breaks up into five more or less square masses as shown in the figure. These quadrate bodies were evidently taken by Baillon for throat scales such as exist in various other Apocynaceae. Neither Jumelle and Perrier, nor Hochreutiner mention such bodies in their descriptions of species of *Plectaneia*.

According to Professor Jumelle and M. Perrier de la Bathie, *P. elastica* yields a rubber of good quality. They state that 1 litre of the latex of 'piraovaovao' yields 16–18 grammes of dry rubber. The Sakalaves cut the stems down in order to obtain the rubber, but the French authorities suggest that old stems which reach 20 cm. in diameter might be tapped by simple incisions. The coagulation of the latex is brought about by the natives by exposure to the sun and subsequent fermentation. Alcohol and acids do not yield satisfactory results. *P. Thouarsii* is said to be useless as a rubber plant.—O. Stapf.

P. elastica: flowering branch and fig. 1, flower; 2, pistil and part of calyx; 3, corolla, opened out; 4, anthers; 5, transverse section of ovary; 6, longitudinal section of ovary. *All enlarged.*

P. Thouarsii: fig. 7, section through the follicles before they have begun to separate; 8, a fruiting branch; 9, a seed. *All enlarged except* 8, *which is of natural size.*

M. Sidel[illegible]

Tabula 3025.

SAPIUM CLADOGYNE, *Hutchinson.*

Euphorbiaceae. Tribus Crotoneae.

S. cladogyne, *Hutchinson in Kew Bull.* 1912, p. 224; affinis *S. Jenmani,* Hemsl., sed flores utriusque sexus in spicas distinctas dispositi, nempe ♂ ad axin primariam post anthesin deciduam restricti, ♀ in axibus secundariis ad basin primariae ortis post spicae masculae lapsum evolutis persistentibus siti.

Arbor 6–7 m. alta; ramuli juniores glabri. *Folia* sparsa, oblonga vel oblongo-elliptica, obtuse caudato-acuminata, basi plerumque cuneata, 4–12 cm. longa, 2–4·5 cm. lata, integra vel remotissime glanduloso-denticulata, chartacea, crebre minuteque pellucido-punctata, nervis primariis lateralibus utrinsecus 8–10 arcuatis prominentibus; petioli 1–2·5 cm. longi, apice glandulis lateralibus sessilibus parvis instructi. *Inflorescentiae* bisexuales, ramulos laterales breves terminantes. *Spicae* ♂ terminales, graciles, ad 12 cm. longae, post anthesin deciduae; spicae ♀ 2, subopppositae, sub maris anthesi vix evolutae, ad basin rhachis sitae. *Flores* ♂ 8–9 aggregati, glandulis geminatis peltatis suffulti; bracteae semiorbiculares; bracteolae setulosae. *Calyx* bipartitus, glaber; segmenta suborbicularia. *Stamina* 2: filamenta 1 mm. longa, crassa, glabra; antherae 0·75 mm. latae. *Flores* ♀ haud visi. *Infructescentiae* geminatae, pedunculatae, 4–7 cm. longae; rhachis leviter flexuosa, glabra. *Capsulae* crustaceae, 1-loculares, 1-spermae, subglobosae, circiter 0·7 cm. diametro, 2-valves. *Semina* subglobosa, paullo compressa, 0·5 cm. diametro, extra pulposa. — *S. Jenmani,* Hemsl. in Hook. Ic. Pl. sub. t. 2649, quoad Jenman, 7505; Pax in Engl. Pflanzenr.-Euphorb. Hippomaneae, p. 217, partim.

South America: British Guiana; Head of Pomeroon River, *Jenman,* 7505; Arriah Tributary, Upper Pomeroon River, *Beckett,* 8628; Fort Island, Essequibo River, *Beckett,* 8767, 8768; *Stockdale,* 8766; cultivated in the Botanic Gardens, Georgetown, *Foote*; *Bartlett,* 8724; *Stockdale,* 8765; *Greeves,* 8766.

As the writer has already stated when describing the species in the Kew Bulletin (l.c.), *Sapium cladogyne* is very closely allied to

S. Jenmani, Hemsl., figured at t. 2649 of this work. Although apparently identical in their vegetative parts, the two species may be readily distinguished by a remarkably interesting difference in the form of the inflorescence.

In typical *S. Jenmani* the inflorescence is unbranched, and the female flowers are disposed for some distance along the lower part of the rhachis, the upper part being male. The flowers of both sexes are evidently mature about the same time, or they may be slightly protogynous. In *S. cladogyne*, however, there is an entirely different arrangement which serves to prevent any pollination of the females by males of the same inflorescence. The latter consists of a central male spike with two very short lateral branches at the base, which bear the female flowers. During the flowering stage of the male these female branches are very small and only imperfectly developed, but when the male portion has flowered and fallen away they grow out and bear fruit. In the fruiting stage the large scar left by the male at the point where it articulated is always plainly visible in the sinus of the two infructescences. It seems probable then that the females become fully developed either at the end of the season and are pollinated by flowers from younger inflorescences, or at the beginning of the next flowering season when fresh male flowers are matured on other parts of the plant.

The growth of the two species under cultivation has been observed to be different: the primary branches of *S. Jenmani* are directed upwards and form an acute angle with the stem, whilst those of *S. cladogyne* spread from it almost horizontally.—J. Hutchinson.

Fig. 1, base of leaf-blade showing petiolar glands; 2, apex of leaf; 3, male flowers with subtending glands; 4, male flower; 5, bract; 6, unripe fruit; 7, fruit dehiscing; 8, seeds. *All enlarged.*

M S delt et lith

Tabula 3026.

SLADENIA CELASTRIFOLIA, *Kurz.*

TERNSTROEMIACEAE.

S. celastrifolia, *Kurz in Journ. Bot.* 1873, p. 194, t. 133, f. 1; *Dyer in Hook. f. Fl. Brit. Ind.* vol. i. p. 281; species unica.

Arbor 6–9 m. alta, ramulis hornotinis angulatis pilis simplicibus puberulis, senioribus subteretibus glabrescentibus. *Folia* alterna, exstipulata, ovata vel elliptico-oblonga, basi obtusa vel cuneata, apice acute acuminata, 4–12 cm. longa, 2–5 cm. lata, crenato-serrata, tenuiter coriacea, praeter petiolum et partem inferiorem costae subtus puberulam glabra; nervi laterales utrinsecus 6–7, satis obliqui; petioli anguste alati, 0·5–1 cm. longi, juventute puberuli, demum glabrescentes. *Cymae* axillares, dichasiales, bis ad quater furcatae, floribus articulatis; pedunculi florum ultimorum 4·5 mm. longi; pedicelli florum centralium furcarum 1 mm. longi, medio articulati. *Sepala* 5, persistentia, imbricata, elliptico-oblonga, 4·5 mm. longa, 2·5 mm. lata, apice rotundata vel inconspicue retusa, scariosa. *Petala* 5, imbricata, basi leviter connata, obovato-oblonga, 5 mm. longa, 2·7 mm. lata, inferne 5-nervia, superne 7-nervia. *Stamina* saepius 10, rarius 11–13, uniseriata, basi petalorum leviter affixa; filamenta 1·5 mm. longa, 0·8 mm. lata, crassissima, infra antheras constricta, introrsum flexa; antherae introrsae, anguste lanceolatae, circiter 2 mm. longae, patule pilosulae, basi leviter sagittatae, setulosae, apice breviter bifidae, thecis apice setulis singulis vel binis terminatis, apice rima ventrali poriformi dehiscentes. *Pistillum* 4 mm. longum; ovarium ovoideum, in stylum crassum apice trifidum angustatum, inferne 10-costatum, costis basi valde incrassatis prominentibus glandularibus discum simulantibus, superne 20-costatum, triloculare; styli rami 0·3–0·4 mm. longi, acuti; ovula pro loculo bina, pendula, anatropa, longe rostrata, 2 mm. longa, rhaphi adaxiali. *Fructus* nondum maturus 3-locularis, siccus, exocarpio papyraceo, endocarpio crustaceo; parietes tenues; dissepimenta crassissima.

INDIA: Burma; Shan Hills, Wetwun, near the Maymyo Plateau, *Lace*, 6252; S. Shan States, Taunggyi, 1400 m., *Watson*, 246.

China: Yunnan; Mynela (Muangla), *Anderson*; Szemao, 1350–1500 m., *Henry*, 11884 A, 11884 B, 11884 D.

The genus *Sladenia* was referred to *Ternstroemiaceae* by Kurz and Thiselton-Dyer, ll.cc. It agrees on the whole with the diagnosis of that family given in Bentham and Hooker's Genera Plantarum, but differs from all the other genera in its dichasial cymes. The external appearance of the ovary and fruit recalls *Lophira* (*Ochnaceae*); and the filaments resemble those of some *Dipterocarpaceae*. Mr. L. A. Boodle, who has kindly examined material, reports that the anatomical characters of the leaf and stem are not specially distinctive. They are such as might be found in members of a certain number of different families, one of the latter being the *Ternstroemiaceae*. The anatomy does not agree well with that of the *Ochnaceae*, one important difference being the absence of cortical bundles in *Sladenia*.

According to Engler's latest scheme of classification,* *Sladenia* should be referred to *Parietales-Theineae*, but cannot be assigned to any of the families included in that group. When mature fruit and seeds are known, it may be necessary to found a new family for its reception. Examination of young fruits suggests that the fruit may split septicidally into three cocci.

Gilg, from description, referred *Sladenia* tentatively to *Dilleniaceae*, in which he also included *Actinidia*, *Saurauja* and *Clematoclethra*.† These three genera are, however, so distinct from the remaining *Dilleniaceae*, that it seems better either to leave them in *Ternstroemiaceae*,‡ or to treat them as an independent family *Actinidiaceae*.§ *Sladenia* cannot be retained in *Dilleniaceae* in either case, as it has little in common with the subfamily *Dillenioideae*.—T. A. Sprague.

Fig. 1, flower; 2, a stamen; 3, pistil; 4, longitudinal section of pistil; 5, transverse section of the same; 6, ovule; 7, immature fruit. *All enlarged.*

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* Syllabus der Pflanzenfamilien, ed. 7 (1912).

† Engl. & Prantl, Nat. Pflanzenfam. vol. iii. pars 6, p. 128; Nachtr. ii. p. 44.

‡ Dunn in Journ. Linn. Soc., Bot., vol. xxxix. p. 394.

§ Van Tiegh. in Journ. de Bot. vol. xiii. p. 170; Ann. Sc. Nat., sér. 8, vol. x. p. 137.

M S. del. et lith

Tabula 3027.

EMMENOSPERMA PANCHERIANUM, *Baill.*

Rhamnaceae. Tribus Rhamneae.

E. Pancherianum, *Baill. in Adansonia,* vol. xi. p. 269 ; inflorescentiis contractis foliis buxiformibus distincta.

Arbor parva vel frutex multicaulis. *Ramuli* cinerei, minute puberuli. *Folia* subopposita vel alterna, obovata vel obovato- elliptica, 1–3 cm. longa, 0·6–1·7 cm. lata, basi plus minusve cuneata, apice obtusissima, rotundata vel retusa, integerrima, tenuiter coriacea, glabra ; nervi laterales utrinsecus circiter 3, satis obliqui ; petioli 1·5–4 mm. longi. *Thyrsi* axillares, contracti, minute ferrugineo-pubescentes, foliis breviores ; flores in axillis bractearum rhachis brevis fasciculati, pentameri ; pedicelli basi bracteati, 2–3 mm. longi. *Sepala* deltoideo-ovata, vix ultra 1 mm. longa, circiter 1 mm. lata, intus carinata, carina apice incrassata valde prominente deorsum sensim diminuta. *Petala* breviter unguiculata, valde concava marginibus inflexis, stamina amplectentia, circiter 1 mm. longa. *Discus* tenuis, receptaculum vestiens. *Filamenta* 1·5 mm. longa, sursum sensim angustata, apice inflexa ; antherae subreniformes thecis apice confluentibus. *Pistillum* in fundo receptaculi liberum ; ovarium 0·5 mm. longum, semi-ovoideum, biloculare ; stylus 0·7 mm. longus stigmate leviter bifido incluso, crassus ; ovula pro loculo solitaria, erecta. *Capsula* in coccos tres secus suturas ambas findentes septicide dehiscens. *Semina* compresso-ellipsoidea, 4·5–5 mm. longa, 3·5–4 mm. lata, basi valde concava, minutissime lepidota, intense rubra. *Testa* cornea. *Albumen* carnosum. *Embryo* magnus ; cotyledones late ellipticae, basi anguste cordatae ; radicula brevis, crassa, truncata.

Polynesia : New Caledonia ; *Pancher* ; *Caldwell.*

Emmenosperma is allied to *Alphitonia,* from which it differs in its free ovary and capsular fruit. Three species are known, the other two being natives of Australia.—T. A. Sprague.

Fig. 1, flower, side view ; 2, flower, flattened to show interior ; 3, longitudinal section of flower ; 4, petal and stamen ; 5, petal ; 6, stamens ; 7, longitudinal section of pistil ; 8, seed ; 9, seed, enlarged ; 10, longitudinal section of seed. *All enlarged except* 8, *which is of natural size.*

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Tabula 3028.

LEPTODERRIS BRACHYPTERA, *Dunn.*

Leguminosae. Tribus Dalbergieae.

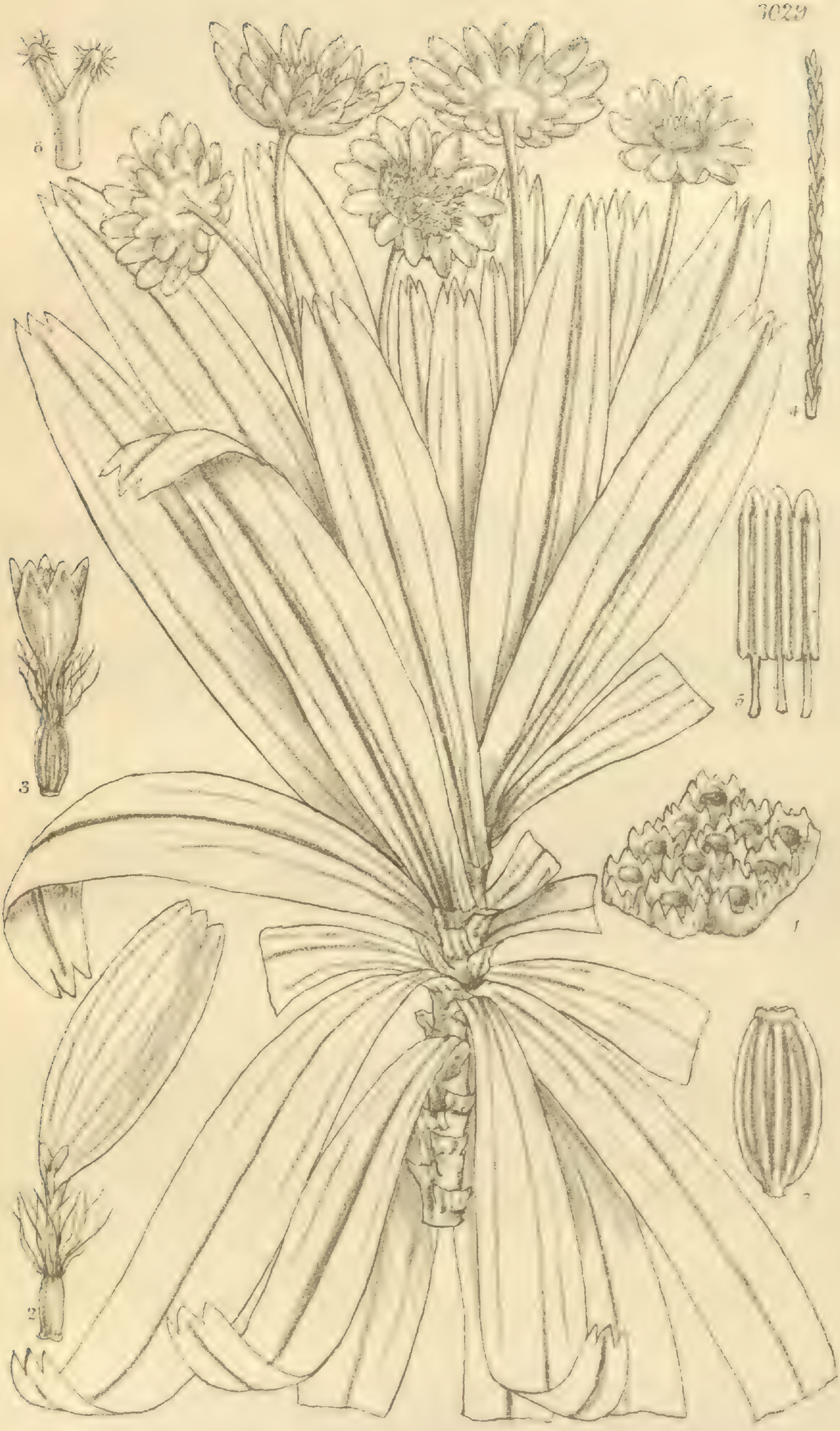
L. brachyptera, *Dunn in Kew Bull.* 1910, p. 388; a *L. Goetzii*, Dunn, foliolis supra opacis membranaceis haud reticulatis differt.

Frutex magnus, ad 24 m. scandens vel erectus et tunc fere 2 m. altus. *Folia* 1–3-juga, 30–50 cm. longa; foliola ovata, basi rotundata, apice truncata, emarginata vel subbiloba, 15–25 cm. longa, membranacea, supra opaca, praeter venas glabra, subtus tomentosa, venis marginem approximantibus 6–9-paribus; stipellae setaceae. *Panicula* terminalis, ramosa, ramis bracteatis ut rhachi dense breviter tomentosis. *Flores* albo-rosei, fragrantes, 1·2–1·5 cm. longi, 2–5 in nodis rotundatis sessiles, secus rhachin dense dispositi. *Calyx* anguste campanulatus, puberulus, basi late bibracteatus, 4 mm. longus, dentibus ovatis 1 mm. longis. *Petala* glabra. *Vexilli* lamina cymbiformis, basi cordata, bimaculata; alae falcato-oblongae, basi semisagittatae; carinae petala ovata, basi alis similia. *Stamina* monadelpha, vexillare basi solutum. *Ovarium* lineare, pubescens, biovulatum. *Legumen* oblongum, 6–8 cm. longum, uno latere alatum; ala 3–4 mm. lata. *Semen* saepe unicum.—*Lonchocarpus brachypterus*, Benth. in Journ. Linn. Soc. vol. iv. Suppl. (1860) p. 100. *Derris brachyptera*, Baker in Oliv. Fl. Trop. Afr. vol. ii. (1871) p. 246; De Wild. in Ann. Mus. Congo, sér. 5, vol. i. (1904) p. 149. *Pterocarpus brachypterus*, O. Kuntze, Rev. Gen. Pl. vol. i. (1891) p. 203. *Deguelia brachyptera*, Taub. in Bot. Centralbl. vol. xlvii. (1891) p. 386; Hiern, Cat. Welw. Afr. Pl. vol. i. (1896) p. 283.

West Tropical Africa: Senegambia; *Heudelot*, 828; Angola; *Welwitsch*, 1889.

The fragrant pink flowers are sometimes produced so copiously in the dense forests of Cungulungulo (Angola) as to hide completely the tree on which the creeper grows.—S. T. Dunn.

Fig. 1, bracteole; 2, flower with corolla removed and calyx laid open; 3, vexillum; 4, wing-petal; 5, keel-petal; 6, pistil; 7, longitudinal section of ovary; 8, fruit. *All enlarged except* 8, *which is of natural size.*



M.S. delt et lith.

Tabula 3029.

EURYOPS DIETERLENAE, *J. M. Wood*.

Compositae. Tribus Senecionideae.

E. Dieterlenae, *J. M. Wood in Kew Bull.* 1914, p. 335; ex descriptione affinis *E. Evansii*, Schlechter, sed foliis et floribus radii multo majoribus, involucri bracteis circiter 16 differt.

Frutex ramosus, usque ad 2·5 m. altus; caules et rami superne dense foliati, glauci, glabri, circiter 0·5 cm. crassi. *Folia* sessilia, basi subamplexicaulia, lineari-oblanceolata, apice crasse tridentata, dentibus triangularibus acutis 2–5 mm. longis, 7–9 cm. longa, 1·3–1·6 cm. lata, rigide coriacea, margine anguste cartilaginea, sicco flavo-vel glauco-viridia, utrinque glabra, apicem versus trinervia, ceterum evenia. *Capitula* multiflora, fere 3 cm. diametro, ad apices ramorum aggregata, pedunculata, pedunculis folia superiora vix superantibus. *Involucrum* late cupuliforme, circiter 6 mm. altum; bracteae circiter 16, inferne connatae, 1 cm. longae, glabrae, parte libera oblongo-lanceolata subacuta 0·5 cm. longa 3–3·5 mm. lata. *Receptaculum* convexum, conspicue foveolatum, circiter 0·5 cm. latum. *Flores* radii circiter 14, flavi; corollae tubus anguste cylindricus, 2·5 mm. longus, glaber; limbus oblongo-ellipticus, apice rotundatus, 1 cm. longus, 0·5 cm. latus, prominenter 5-nervius; styli rami exserti, 0·5 mm. longi. *Flores* radii numerosi; corollae tubus 3·5 mm. longus, inferne cylindricus, superne ampliatus, glaber; lobi 5, oblongo-ovati, subacuti, 1 mm. longi, 0·75 mm. lati; antherae 2 mm. longae, apiculatae; styli rami 0·5 mm. longi. *Achaenia* oblonga, 1·75 mm. longa, longitudinaliter sulcata, glabra; pappi setae caducissimae, usque ad 3 mm. longae, albae, barbellatae.

South Africa: Natal; near Bulwer, 1800–2100 m., April, *W. J. Haygarth in Herb. Wood*, 12601. Basutoland; Leribe, *Mrs. Dieterlen*, 465.

The genus *Euryops* is represented in South Africa by about 40 species, all of which are endemic. Of the remaining species of the genus, five or six occur at high altitudes in the mountains of Tropical East Africa, one extending into Arabia; there is one species, which is endemic, in Socotra.

The plant here figured is taller and has longer and broader leaves than any other species of the genus. It was first collected by Mrs. Dieterlen in Basutoland, and subsequently a few examples were found by Mr. W. J. Haygarth on moist and almost inaccessible places on nearly perpendicular rocks on the sides of Amawahqua mountain near Bulwer in Natal.

The nearest affinity of *E. Dieterlenae* is *E. Evansii*, Schlechter, from the Drakensberg Mts. The latter is known to us only from the description and may possibly be the same species; it appears to have much smaller leaves and ray-flowers and fewer involucral bracts. —J. Hutchinson.

Fig. 1, part of receptacle; 2, ray-flower; 3, disk-flower; 4, seta of pappus; 5, stamens; 6, style-arms of disk-flower; 7, achene. *All enlarged.*

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Tabula 3030.

RHAPHIDANTHE OBLIQUIFOLIA, *Hiern*.

R. SOYAUXII, *Stapf*.

Ebenaceae.

R. obliquifolia, *Hiern ex Gürcke in Engl. u. Prantl, Nat. Pflanzenfam.* vol. iv. pars 1, p. 165 ; species vix perfecte nota.

Arbuscula dioica, 4·5 m. alta, ramis gracilibus fuscis vel atrofuscis brevissime hirsutiusculis. *Folia* bifariam mosaice disposita, valde obliqua, oblongo-ovata, basi acuta, apice obtusa vel rotundata, mucronulata, 2–3 cm. longa, 1–1·4 cm. lata, dimidio porro spectante multo majore supra basin latissimo, altero retro spectante medio latissimo, tenuiter coriacea, siccando supra nigro-fusca, glabra, subtus pallida, pruinosa et insuper minute albo-punctata, in costa pilosula, costa supra impressa, nervis lateralibus inconspicuis ; petiolus 1 mm. longus. *Flores masculi* in foliorum axillis solitarii vel 2–3-ni, subsessiles. *Calyx* subcampanulatus, ultra medium 3- vel saepius 4-partitus, lobis triangularibus acutis, 1–1·5 mm. longus, parce minute pilosulus. *Corolla* hypocrateriformis, in alabastri statu subulato-cylindrica, ad 6 mm. longa ; tubus medio perpaulo dilatatus, 4–4·5 mm. longus, extra minutissime parce pubescens ; lobi ovati, subacuti, vix 2 mm. longi. *Stamina* 2–3, e toro orti ; filamenta basi connata, fulvo-pilosa, 0·5–0·75 mm. longa ; antherae lineares, apiculatae, lateraliter dehiscentes, 2 mm. longae, connectivo in dorso piloso. *Ovarii rudimentum* nullum. *Flores feminei* atque *fructus* ignoti.

West Tropical Africa : Spanish Guinea ; Rio Muni Territory, Mount John, Kongui River, *Mann*, 1800.

The genus to which our illustration relates was described by Mr. W. P. Hiern in 1873 in his monograph of the family *Ebenaceae*, published in the Transactions of the Cambridge Philosophical Society (vol. xvii, pars 1, p. 65). No name is there bestowed on the genus, which, when subsequently taken up by Dr. Gürcke in the Pflanzenfamilien, was termed *Rhaphidanthe*, the manuscript name which Hiern had inscribed on the sheets in the Kew herbarium containing specimens collected by Mr. G. Mann in the Rio Muni Territory. These

specimens have only male flowers and Hiern knew only flowers of this sex. But Gürcke, who has treated *Rhaphidanthe* as, so far, a monotypic genus, has attributed to the solitary species, *R. obliquifolia*, fruits of an oblong-ovoid shape, 1·5 cm. long. This circumstance indicates that Gürcke had access to fruiting specimens obtained by some collector other than Mann, and the probability is that these fruiting specimens were some collected by Soyaux on the Sibange Estate in the Munda district, about 50 miles to the south of the locality in which Mann's plant was found; these Soyaux distributed as his n. 238. The example of Soyaux, 238, at Kew has been written up ' an Rhaphidanthe Hiern MSS ? ' and a fruiting twig of this specimen is here figured (figs. B, 5–9). The plant of Soyaux is so like that of Mann that there can be no doubt as to their being congeneric. There is, however, considerable doubt as to their being conspecific; the leaves of the Sibange plant are much smaller and are uniformly sparingly hairy beneath. The characteristic papillae which impart a uniformly glaucous appearance to the underside of the leaves in Mann's specimens are, in the plant of Soyaux, confined to certain patches of epidermal cells; they are absent from relatively wide areas along the nerves and veins, which therefore show up more distinctly. The conclusion to which the facts point is that Soyaux n. 238 represents a distinct species, closely allied to *R. obliquifolia*, based on Mann n. 1800, which may be known as *R. Soyauxii*, and may be described as follows :—

R. Soyauxii, *Stapf*; species nova *R. obliquifoliae* affinis, sed foliis minoribus pro longitudine latioribus subtus undique parce pilosis, papillis epidermatis ad areas quasdam inter venulas sitas repressis facillime distinguenda.

Arbuscula 2 m. alta, omnino habitu *R. obliquifoliae*, ramis indumento eodem ac in *R. obliquifolia*. *Folia* valde obliqua, elliptica, basi acuta, apice rotundata, minute mucronulata, 1–1·5 cm. longa, 0·7–0·8 cm. lata, tenuiter coriacea, exsiccando supra nigro-fusca, glabra, infra paulo pallidiora, praeter nervos venulasque leviter pruinosa, undique pilis sparsis adpressis conspersa, costa et interdum nervis lateralibus basalibus supra levissime impressis; petiolus vix 1 mm. longus. *Flores* utriusque sexus ignoti. *Fructus* solitarii in foliorum axillis, subsessiles, suboblique ovoidei, sub apice paulo constricti, styli basi apiculati, circiter 2 cm. longi, 1 cm. diametro, an 3-loculares, pericarpio exsiccato crustaceo verruculoso praeter apicem summum subtomentosum pilis parce consperso. *Semina* ellipsoidea, uno latere explanata, 12 mm. longa, 7 mm. lata, testa tenui atro-brunnea in latere convexa nervo singulo simplice vel furcato impresso fere circumcirca percursa; endosperma amplum, subosseum, album. *Embryo* rectus, semine paulo brevior; cotyledones foliaceae, ovatae, quam radicula paulo longiores.

Tropical West Africa: Spanish Guinea; Munda, Sibange, *Soyaux*, 238.

The characters of the fruit of *R. Soyauxii* afford an opportunity of supplementing the description of the genus *Rhaphidanthe* if it were certain that the genus could be maintained. This, however, is in any case questionable; if we accept the genus *Diospyros* as circumscribed by Hiern in his monograph and by Gürcke in the *Pflanzenfamilien*, it is indeed inadmissible, because there is no character left to exclude *Rhaphidanthe* from *Diospyros* except the smaller number of stamens, usually 2–3 in *Rhapidanthe* as against 4–∞ in *Diospyros*. If we consult Hiern's excellent key to the species of *Diospyros* we find ourselves led to the section *Noltia*, the basis of which is *N. tricolor*, Schum. & Thonn., a plant known only from the Gold Coast, and, imperfect as our acquaintance with that species is, there seems little doubt that *Rhaphidanthe* approaches the Gold Coast plant more nearly than it does any other species of *Diospyros*. But *Noltia* is a rather heterogeneous group and may, like the genus *Diospyros* itself, have to be revised and readjusted. Such a readjustment is, however, beyond the scope of the present note, which has as its aim the bringing together all that is known at present regarding *Rhaphidanthe*.—O. Stapf.

A. Rhaphidanthe obliquifolia ♂. Fig. 1, bud of male flower; 2, corolla of male flower; 3 and 4, stamens. *All enlarged.*

B. Rhaphidanthe Soyauxii ♀. Fig. 5, fruit seen from the base; 6 and 7, seeds; 8, transverse section of a seed; 9, longitudinal section of a seed. *All enlarged except* 6, *which is of natural size.*

M.S. del'et lith.

Tabula 3031.

CYPSELOCARPUS HALORAGOIDES, *F. Muell.*

Phytolaccaceae. Tribus Gyrostemoneae.

Cypselocarpus, *F. Muell. Fragm.* vol. viii. (1873), p. 36 ; *Benth. in Benth. et Hook. f. Gen. Plant.* vol. iii. p. 62 ; *Volck. in Engl. u. Prantl, Nat. Pflanzenfam.* vol. iii. pars i. A. p. 91 ; inter genera *Gyrostemonearum* ovario uniloculari et fructu singulari distinctissimum, habitu *Didymothecae* et *Tersoniae.*

Flores unisexuales, axillares, ebracteolati ; masculi ignoti. *Flos femineus* : *Perianthium* minutum, membranaceum, plerumque 3-, rarius 2- vel 4-lobum, antice (latere abaxiali) ad basin apertum, inde unilaterale, lobis obtusis subinaequalibus, fructu immutatum. *Pistillum* primo cylindrico-oblongum, deinde medio paulo constrictum, dimidio inferiore ovarium uniloculare, superiore stylum crassum referente ; stylus primo solidus, mox cavernosus et in vertice obliquo excavatus ; stigma pro rata magnum, fimbrillatum, fimbriis exterioribus basi varie connatis ante anthesin antice deflexis, deinde styli depressionem modo hippocrepiformi ambientibus. *Ovulum* e basi adscendens, campylotropum, micropyle abaxiali, arillo minuto. *Fructus* (stylo incluso) nucamentaceus, breviter subcylindricus, basi dilatatus et excavato-truncatus, medio constrictus, apice obliquus, late excavatus, viridulus ; pericarpium, uti stylus cavus, durum, crassiusculum. *Semen* erectum, oblique pyriforme, arillo obscuro membranaceo ; testa crustacea, tenuis, badia, tenuiter rugulosa ; endosperma carnosum, parcum, periphericum et inter embryonis cotyledones et radiculam intrusum. *Embryo* oblique subhippocrepiformis ; radicula inferior, cotyledones superans ; cotyledones plano-convexae, subangustae, radiculae parallelae.—Suffrutex *ramosus, procumbens, ramis ascendentibus, parce pilis minutis papilliformibus saepe furcatis vel substellatis asperulus.* Folia *sparsa, lineari-lanceolata, plana, carnosula.* Flores *axillares, solitarii, brevissime pedicellati.* Fructus *specie sessiles, angulo recto patentes.*

C. haloragoides, *F. Muell.*, l.c. ; species unica.

Suffrutex ramis a basi ascendentibus vel prostratis ad 40 cm. longis parce ramosis subasperis pallide viridibus. *Folia* lineari-lanceolata,

acuta, basi sensim in petiolum brevissimum attenuata, inferiora ad 2 (rarius 2·5) cm. longa, ad 6 mm. lata, caetera minora, pallide viridia, carnosula, magis minusve papilloso-asperula. *Flores* ♀ secundum ramos saepe a basi dispositi, sub anthesi circiter 2 mm. longi, virides. *Pistillum* antice papilloso-pilosulum. *Fructus* 4–5 mm. longi, 2 (vel superne fere 3) mm. diametro, viridi-olivacei, glabrati. *Semen* 2 mm. longum.—*Threlkeldia haloragoides*, F. Muell. ex Benth. Fl. Austral. vol. v. p. 198.

South West Australia: In the interior, *Drummond*, 55, 438.

This species was originally placed in *Threlkeldia* in *Chenopodiaceae* by Mueller and Bentham, but was subsequently referred to *Phytolaccaceae* by the former in his *Fragmenta*, where it stood as the representative of a new genus, the position of which in the family was, however, left undefined. Bentham in the *Genera Plantarum* accepted the new genus, but moved it back to *Chenopodiaceae* assigning it a place next to *Threlkeldia* in *Chenoleae*. Volckens in Engler and Prantl's Natürliche Pflanzenfamilien enumerates it at the end of *Chenopodiaceae* as a genus of doubtful affinity. In the writer's opinion there can be no doubt that its affinity is with the *Gyrostemoneae* in *Phytolaccaceae*. It shares with them all the vegetative characters to a high degree and also the structure of the seed, apart from the extreme reduction of the aril. It appears, however, highly specialised in that it possesses only one carpel which develops into a peculiarly shaped hard nut. The rudimentary perianth is open on the side facing the supporting leaf, but is otherwise of the same nature as in the other *Gyrostemoneae*. The stout, cavernous and ultimately quite hollow style which is open upwards, and has a much divided fringed stigma, is very peculiar, but the stigmatic character finds its counterpart in *Tersonia*, although the somewhat fleshy or waxy divisions are less numerous and more regularly arranged in that genus. Although reduced to a single carpel, the gynaecium of *Cypselocarpus* shows traces of the symmetry of the carpels of its polymerous allies. The very light and yet hard-shelled smooth fruits seem to be equally well adapted for transport by wind (rolling) and by water.—O. Stapf.

Fig. 1, diagram of flower; 2, young flower; 3, fully developed flower; 4, hairs of flower; 5, longitudinal section of young flower; 6, longitudinal section of older flower; 7, a 3-lobed perianth; 8, a 4-lobed perianth; 9, fruit; 10, longitudinal section of fruit; 11, seed; 12, transverse section of seed; 13, longitudinal section of the same. *All enlarged.*

M C. delt et

Tabula 3032.

APODISCUS CHEVALIERI, *Hutchinson.*

Euphorbiaceae. Tribus Phyllantheae.

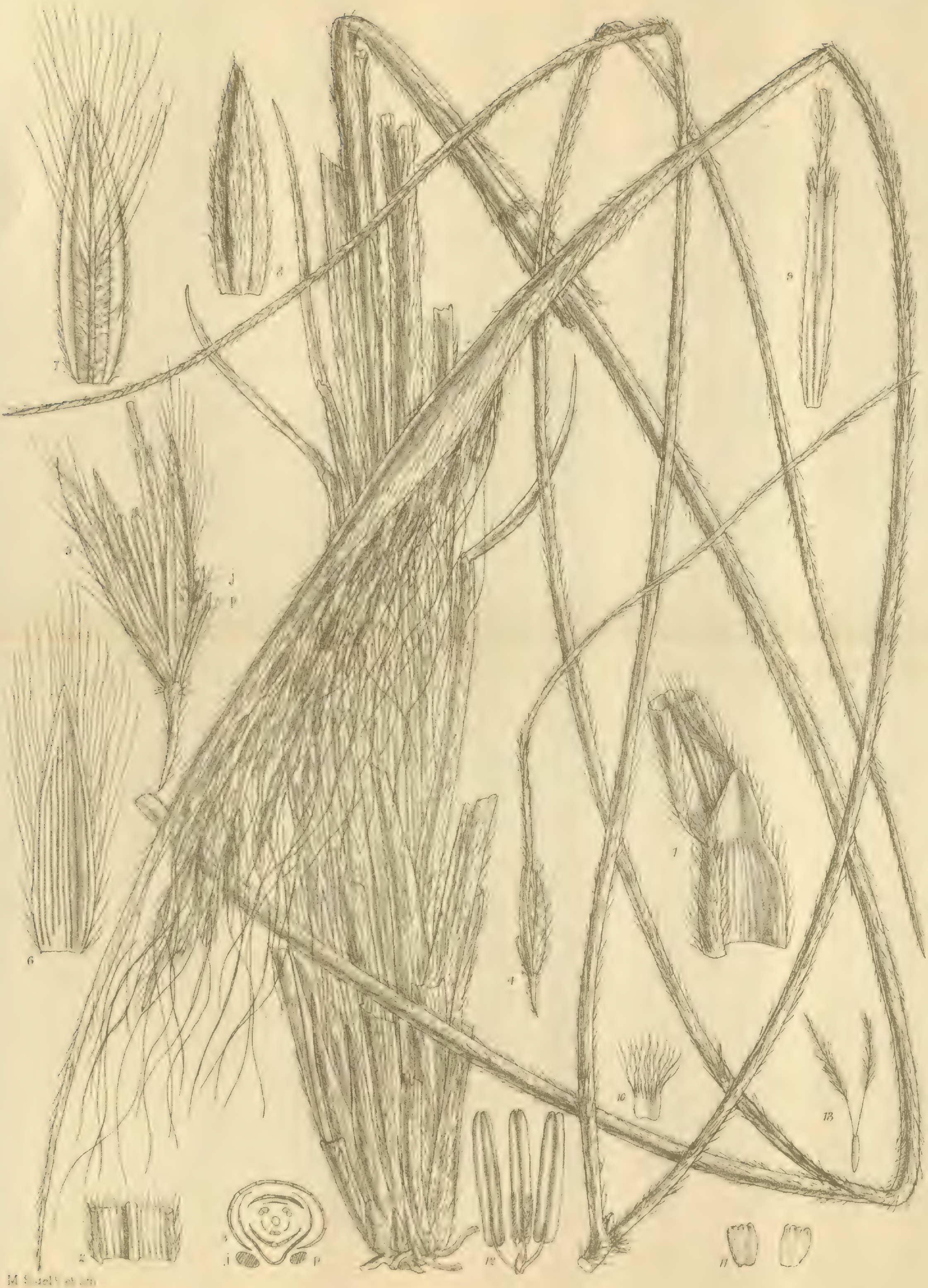
A. Chevalieri, *Hutchinson in Bull. Soc. Bot. Fr.* 1911, Mém. viii. p. 206, et *in Dyer, Fl. Trop. Afr.* vol. vi. sect. 1, p. 1046; species unica.

Arbor 8–10 m. alta; ramuli sulcati vel longitudinaliter verrucosi, glabri. *Folia* oblonga vel oblongo-elliptica, obtuse vel subacute acuminata, basi subcuneata, 8–17 cm. longa, 3–8 cm. lata, integra, coriacea, supra paulum nitida, subtus pallida, utrinque glabra, nervis lateralibus utrinque 8–14 arcuatis prope marginem ramosis subtus leviter elevatis, venis laxis subparallelis; petioli 0·5–1 cm. longi, sicco nigri, supra late canaliculati, verrucosi, glabri; stipulae lanceolatae, acutae, circiter 7 mm. longae, coriaceae, glabrae, mox deciduae. *Spicae* axillares, 2–5-fasciculatae, ad 6 cm. longae; rhachis cum bracteis sepalisque fulvo-tomentella. *Flores* ♂: *Bracteae* late ovatae, subacutae, 1 mm. longae. *Sepala* ovata, obtusa, 1·5–2 mm. longa, 1–1·25 mm. lata, coriacea, utrinque tomentella. *Disci glandulae* carnosae, rotundatae, breviter hirsutae. *Filamenta* glabra; antherarum loculi distincti. *Ovarii rudimentum* dense tomentosum. *Flores* ♀: *Pedicelli* robusti, 6 mm. longi, breviter pubescentes. *Sepala* quam in floribus ♂ paullo majora. *Ovarium* 4-lobatum, parce pubescens; styli crassi, incurvi, extra papillosi.

West Tropical Africa: French Guinea; Fouta-Djalon, between the Santa River and Timbo, March, *Chevalier*, 12588; banks of the tributaries of the Bowali River, tree 8–10 m. high, with white flowers, November, *Caille*, 15057, 14997.

Apodiscus is a monotypic genus of *Euphorbiaceae* discovered in French Guinea in 1905 by the celebrated French botanist and traveller, Dr. A. Chevalier. It grows on the banks of rivers in the Fouta-Djalon district. The genus is closely allied to two other genera, *Thecacoris* and *Maesobotrya*; from the former it differs in having the male spikes in fascicles and in having no petals, from the latter by the 4-locular fruit, and from both more particularly in the absence of a disk from the female flowers, the latter a somewhat rare omission in the tribe *Phyllantheae*.—J. Hutchinson.

Fig. 1, portion of inflorescence showing male buds and female flower; 2, male flower with two sepals removed; 3, stamen from behind, accompanied by two disk-glands; 4, front view of stamen; 5, sepal of female flower; 6, young infructescence. *All enlarged except* 6, *which is of natural size.*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Tabula 3033.

HOMOZEUGOS FRAGILE, *Stapf.*

GRAMINEAE. Tribus ANDROPOGONEAE.

Homozeugos, *Stapf*; genus novum *Trachypogoni*, Nees, structura spicularum simillimum, sed spiculis omnibus homoeomorphis bisexualibus distinctissimum.

Spiculae homoeomorphae, subcylindricae, in rhachi racemorum fragili vel magis minusve tenaci 2-natae, una sessilis, altera pedicellata; sessilis cum articulo rhachis et pedicello adjectis decidua, pedicellata a pedicello suo delabens; callus longus, aciniformis, dense barbatus. *Anthoecia* duo: inferius ad valvam vacuam redactum, superius ♂. *Glumae* subaequales, angustae, subchartaceae, apice membranaceae, marginibus involutis; inferior 7–8-nervis, superior 3-nervis. *Valva* inferioris anthoecii hyalina, 2-nervis, superioris basi hyalina, superne coriacea, minute 2-loba, inter lobos aristata, arista geniculata. *Valvula* anthoecii superioris minuta, lodiculas aequans vel brevior. *Lodiculae* 2, cuneatae. *Styli* stigmatibus lateraliter exsertis fere aequilongi. *Stamina* 3, antheris longis. *Caryopsis* ignota.—Gramina *dense caespitosa*. Foliorum *laminae longae, angustissimae, rigidae*; *ligula parva, scariosa*. Racemi *pauci, digitato-fasciculati*.—Species 2, angolenses.

H. fragile, *Stapf*; ab altera specie generis, *H. huillensi*, Stapf (*Pollinia huillensis*, Rendle), foliis haud teretibus nec vere junciformibus, spiculis majoribus magis villosis distincta.

Gramen perenne, dense caespitosum; innovationes intravaginales, cum vaginis vetustis firmis diu persistentibus culmos circumdantes. *Culmi* ultra 1 mm. alti, teretes, 3-nodi, crassiusculi, praeter apices pilosos glabri. *Foliorum* vaginae teretes, arctae vel superiores culmos arctissime cingentes, saepe internodia superantes, dense sericeo-tomentosae, inferiores tandem magis minusve glabrescentes, ad nodos dense sericeo-barbatae; ligulae scariosae, rotundatae, 1–3 mm. longae, ciliolatae et a dorso longius pilosae; laminae anguste lineares, apice longe tenuiter attenuatae, convolutae, ultra 30 cm. longae, explanatae 2–5 mm. latae, in dorso dense sericeo-pilosae, facie glabrae, costa crassa superne valde prominente, nervis lateralibus tenuibus

prominulis. *Inflorescentia* basi vagina summa inclusa; rhachis communis brevis, interdum ad 3–3·5 cm. longa, teres, parce pilosa, ad nodos transverse barbata, internodiis ad 1·2 cm. longis. *Racemi* 3–5, rarius solitarii, subsessiles, 7·5–10 cm. longi, subflexuosi, fragillimi; articuli graciles, 1–1·2 cm. longi, longe ciliati, ciliis superioribus ad 5 mm. longis, obliquissime disarticulati; pedicelli similes, paulo graciliores brevioresque. *Spiculae* anguste lanceolato-lineares, callo 4 mm. longo dempto 1–1·4 cm. longae. *Gluma inferior* explanata lanceolato-oblonga, apice minute truncata, in dorso dense sericeo-pilosa, pilis sursum accrescentibus summis 4 mm. longis, nervis circiter 8, venis transversis paucis. *Gluma superior* angustissime lineari-oblonga, subobtusa, 3-nervis, in dorso pilosa nisi basin versus glabra, ciliata. *Valva* anthoecii inferioris lineari-oblonga, subacuta, pubescens, dense ciliolata, 7 mm. longa; anthoecii superioris anguste linearis, 6 mm. longa, ciliata, apice minute lobata, lobis subulatis; arista gracilis circiter 7·5 cm. longa, infra medium geniculata, columna spiris 2–3 breviter pilosa, seta basi subplumosa pilis ad 2 mm. longis superne multo brevioribus. *Valvula* anthoecii superioris apice ciliata. *Antherae* 6 mm. longae.

West Tropical Africa: Angola; Benguella, country of the Ganguellas and Ambuellas, *Gossweiler*, 4029.

Homozeugos (ὅμος, alike, and ζεύγος, a pair; alluding to the homoeomorphy of the spikelets) has here been compared with *Trachypogon* on account of the great similarity of the structure and shape of the spikelets and their parts; but if, as is done in Hackel's system, more stress be laid on the sexual characters, *Eulalia* would have to be taken into consideration as a possible congener or ally, and indeed *H. huillense* has actually been described as *Pollinia* (§ *Eulalia*) *huillensis*, by Rendle.—O. Stapf.

Fig. 1, portion of leaf with ligule; 2, section of leaf-blade, flattened out; 3, diagram of spikelet (j, joint; p, pedicel); 4, spikelet; 5, the same, more enlarged and opened out (j and p as in fig. 3); 6, lower glume; 7, upper glume; 8, valve of lower (neuter) floret; 9, valve of upper (fertile) floret; 10, valvule of fertile floret; 11, lodicules; 12, stamens and pistil; 13, pistil. *All enlarged.*

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Tabula 3034.

MECONOPSIS FORRESTII, *Prain*.

Papaveraceae. Tribus Papavereae.

M. Forrestii, *Prain in Kew Bull.* 1907, p. 316 et 1915, p. 157 ; *Forrest in Gard. Chron.* 1911, vol. l. p. 51 ; species e grege *Primulinarum* ad *M. lancifoliam,* Franch., proxime accedens sed stigmate sessili vel subsessili apte distinguenda.

Herba biennis, inermis, setis retrorso-patentibus pallide stramineis induta. *Rhizoma* fusiforme, 10 cm. longum, 1·5 cm. crassum. *Folia* omnia radicalia, pauca, lanceolata vel anguste subspathulata, sensim versus basin attenuata, 12–16 cm. longa, 1·5–1·75 cm. lata, margine integra, supra pallide viridia, subtus glaucescentia, utrinque sparse setosa. *Scapus* centralis, 25–60 cm. altus, setis retrorsis indutus, quadrante summo flores 3–5 subaequales, summo erecto excepto patentes vel subreflexos in cymam racemiformem dispositos suffulciens ; pedicelli graciles, subrigiduli, circiter 1 cm. longi, ebracteati. *Sepala* 2, oblongo-ovata, extra parce setosa, 1·5 cm. longa. *Petala* 4, oblonga, 2·25 cm. longa, 1·75 cm. lata, pallide coerulea. *Stamina* ∞, pluriseriata, filamentis coeruleis discretis glabris ; antherae aureae. *Ovarium* e carpellis 3–4 compositum, anguste fusiforme, glabrum vel parce setosum ; stylus obsoletus ; stigma clavatum, lobis decurrentibus contiguis albidus ; placentae invicem nerviformes et intrusae ; ovula plurima. *Capsula* anguste cylindracea, parce setosa, 3–5 cm. longa, 5 mm. lata, pedicellis nunc erectis rigidis ad caulem stricte adpressis. *Semina* reticulata.

China : Yunnan ; eastern flank of the Li-Kiang range, 27°12′N, 3000–3300 m., *Forrest*, 2314 ; mountains in the north-east of the Yang-tse bend, 27°45′N, 3330 m., *Forrest*, 10799 ; mountains of the Chung-tien Plateau, 27°30′N, 3000–3300 m., *Forrest*, 12507, 12672.

This very distinct species was first met with by Mr. G. Forrest in June 1906 and was collected by him again, in fruit, in August 1913 ; he met with it once more in June and in July 1914. It usually occurs in open stony alpine pastures. A very distinct member of the group *Primulinae* in the section *Eumeconopsis*, this species differs from it

nearer allies in having petals which are of a paler blue than in any of these. In its 4-petalous corolla and its raceme-like cyme it comes nearest to *M. lancifolia*, Franch., which has however darker petals, grey anthers and a distinct style. The change in position of the pedicels, which are spreading or even subreflexed in flower, to the erect virgately adpressed one assumed when the fruit is ripe, is in this species very striking. Though the stigma in flower is sessile, a short style develops as the fruit ripens. The species has been introduced to cultivation by Professor Balfour, at the Royal Botanic Gardens, Edinburgh, through seeds obtained by Mr. Forrest in 1914. Though normally biennial, seedlings pricked out late in the season may flower during the first year.—D. Prain.

Fig. 1, stamen; 2, ovary; 3, transverse section of ovary; 4, apex of fruiting cyme; 5, transverse section of capsule; 6, upper third of a capsule, showing dehiscence; 7, seed; 8, longitudinal section of a seed, showing embryo. *All enlarged except 4, which is of natural size.*

M. S. del.et lith

Tabula 3035.

MECONOPSIS CONCINNA, *Prain*.

Papaveraceae. Tribus Papavereae.

M. concinna, *Prain in Kew Bull.* 1915, p. 163; species e grege *Bellarum* ad *M. bellam* accedens sed foliis lanceolatis nec ambitu ovatis minus divisis vel integris, rhizomate lobulato breviore, capsulaque elongata anguste cylindracea valvis altius fissis facillime sejungenda.

Herba forsan biennis, inermis, glabra vel perparce setulosa. *Rhizoma* subtuberosum, 1·5–2 cm. longum, in segmenta 2–3 crassiora divisum, descendens. *Folia* omnia radicalia, lanceolata, saepius runcinata lobulis ovatis vel lineari-lanceolatis obtusis raro iterum divisis 3–7-jugis, nonnunquam aliquot vel omnia integra, supra saturate viridia, subtus glaucescentia, utrinque glabra, 1·5–2 cm. longa, 5 mm. lata; petiolus distinctus, glaber, 1·5–2 cm. longus. *Scapi* numerosi, 5–15 cm. longi, gracillimi, glabri vel setis patentibus parce induti demum glabrescentes, 1-flori. *Sepala* 2, late ovata, extra parce hirsuta vel glabra, 7–8 mm. longa. *Petala* 4, late oblonga, obtusa, apice crenulata vel denticulata, 1·25 cm. longa, 1 cm. lata, coerulea purpureo suffusa. *Stamina* ∞, circiter 32, 4-seriata, filamentis coeruleo-purpureis discretis glabris; antherae cinerascentes. *Ovarium* e carpellis 3–4 compositum, anguste fusiforme, glabrum vel setis perpaucis obsitum; stylus distinctus; stigma clavatum lobis decurrentibus contiguis; placentae nerviformes; ovula plurima. *Capsula* anguste cylindracea, glabra, 2·5–2·75 cm. longa, 4 mm. lata, ad medium usque valvarum dehiscens. *Semina* **brunnea, incurva; testa striata vix reticulata.**

China: Yunnan; mountains in the north-east of the Yang-tse bend, 27°45′N, 3300–3600 m., *Forrest*, 10404, 10979; mountains of the Chung-tien Plateau, 27°30′N, 3000 m., *Forrest*, 12670; mountains west of Feng-kou, 27°40′N, 3000 m., *Forrest*, 12706; north-west flank of the Li-Kiang range, 27°30′N, 3000 m., *Forrest*, 12796.

This neat little species was first met with by Mr. G. Forrest in 1913, and in both gatherings of that year, to which belong the two specimens figured, all the plants have lobulate leaves. In some of the specimens obtained by Mr. Forrest in 1914 a few of the lower leaves are entire

and in one gathering only entire leaves are present so that the plant bears a considerable resemblance to those specimens of *M. lancifolia*, Franch., in which the central raceme-like cyme, which is normal in that species, is replaced by a number of simple 1-flowered radical scapes. In *M. lancifolia* we have the same grey anthers that occur in *M. concinna*, so that care has to be exercised in discriminating between the abnormal simple-scaped state of the former and the abnormal entire-leaved state of the latter. If this care be exercised, however, the possibility of confusing the two plants cannot arise, for in *M. lancifolia* the rhizome is long, simple and fusiform as in *M. Forrestii*, not short and tufted as it is in *M. concinna*. This species affects open stony or limy pastures and the ledges of limestone cliffs.—D. Prain.

Fig. 1, stamen; 2, ovary; 3, transverse section of capsule; 4, upper third of a capsule, showing dehiscence. *All enlarged.*

M. S. delt et lith

Tabula 3036.

MECONOPSIS VENUSTA, *Prain*.

Papaveraceae. Tribus Papavereae.

M. venusta, *Prain in Kew Bull.* 1915, p. 164; species e grege *Bellarum* ad *M. concinnam* et *M. bellam* proxime accedens cum illa quoad capsulam cum hac quoad rhizoma congruens.

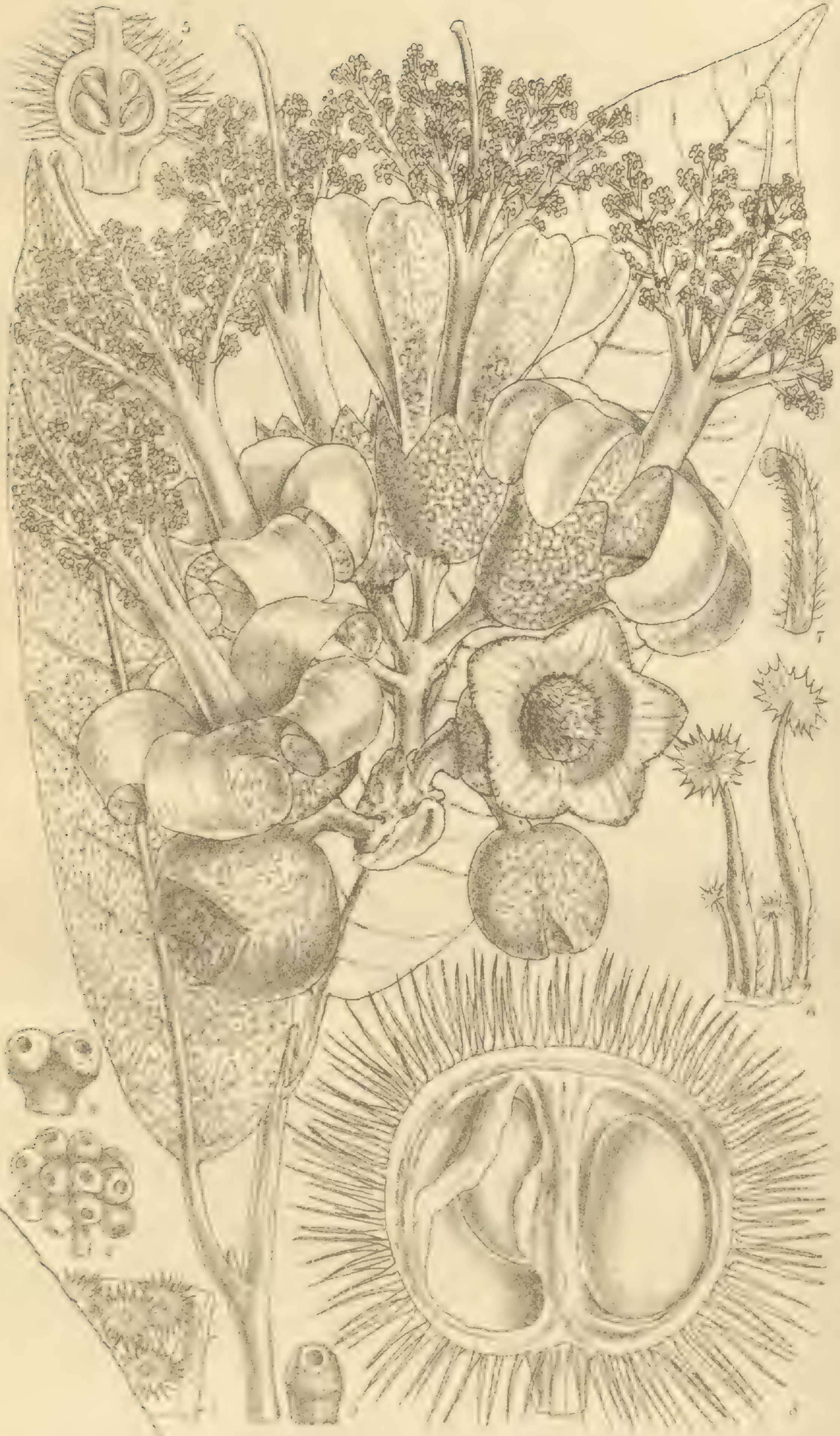
Herba perennis, inermis, glabra vel perparce setulosa. *Rhizoma* elongatum, cylindraceum, 12–14 cm. longum, 1 cm. crassum, descendens. *Folia* omnia radicalia, ima vel rarissime omnia integra lamina oblongo-ovata, obtusa vel subacuta, basi truncata, 1–3·5 cm. longa, 0·8–1 cm. lata, cetera pinnatisecta, lobis 1–2-jugis late oblongis vel orbicularibus, obtusis, terminali 1 cm. lateralibus 3–5 mm. latis, supra saturate viridia, subtus intense glauca, utrinque glabra; petiolus late alatus, 4–6 cm. longus, glaber, margine membranaceus. *Scapi* numerosi, 15–20 cm. longi, graciles, glabri vel setis patentibus parce induti demum glabrescentes, 1-flori. *Sepala* 2, late ovata, extra glabra, 1·25 cm. longa. *Petala* 4, suborbicularia, obtusa, margine integra vel minutissime undulata, 2·25 cm. longa ac lata, intense rubro-purpurea. *Stamina* ∞, circiter 64, 4-seriata, filamentis intense rubro-purpureis gracillimis discretis glabris; antherae aurantiacae. *Ovarium* e carpellis 4 compositum, anguste fusiforme, setis patentibus densius indutum; stylus distinctus; stigma clavatum lobis decurrentibus contiguis; placentae nerviformes; ovula plurima. *Capsula* anguste cylindracea, setis rigidis patentibus vestita, 3·5–4 cm. longa, 5 mm. lata, vix per trientem summum dehiscens. *Semina* cinnamomea, incurva; testa striata vix reticulata.

China: Yunnan; mountains in the north-east of the Yang-tse bend, 27°45′N, 3300 m., *Forrest*, 10408, 11008; mountains of the Chung-tien Plateau, 27°30′N, 3300–3600 m., *Forrest*, 12685, 12686, 12993.

The charming *Meconopsis* here figured is a member of the group *Bellae* in the section *Eumeconopsis*, which was first met with by Mr. G. Forrest in 1913 and was obtained by him again in the following year. The lowest leaves appear to be always entire and in some of the specimens collected in 1914 this is true of all the leaves. In its stout, long root-

stock, the collar of which is crowned by the remains of the leaves of an earlier season, and in its general facies, it closely resembles *M. bella* from the Eastern Himalaya, but differs in having long narrow subcylindric capsules in place of short ovate ones. It also greatly resembles *M. concinna* from Yunnan, with which it agrees as regards capsules, but from which it differs much as regards its rootstock and in the colour of its anthers. As regards habitat it agrees with *M. concinna*; it occurs on stony limy alpine pastures, and on humus-covered boulders. —D. Prain.

Fig. 1, stamens seen from in front and from behind; 2, ovary; 3, transverse section of capsule; 4, a ripe capsule; 5, upper third of a capsule, showing dehiscence. *All enlarged.*



Tabula 3037.

BOSCHIA MANSONI, *Gamble.*

Bombacaceae.

B. Mansoni, *Gamble in Kew Bull.* 1908, p. 445 ; columna staminali a speciebus ceteris distincta.

Arbor magna. *Ramuli* graciles, ut petioli, lamina subtus, inflorescentia, calyces extra et ovaria, squamis peltatis argenteo-fulvis dense obtecti. *Folia* elliptico-oblonga ad lanceolata, apice acuminata, basi rotundata vel subcordata, 8–20 cm. longa, 3–6 cm. lata, supra viridia, glabra, costa impressa nervis lateralibus inconspicuis, subtus dense lepidota, costa valde prominente nervis lateralibus prominulis patulis intra marginem arcuato-connexis majoribus utrinsecus circiter 10 ; petioli 1–2 cm. longi. *Inflorescentiae* in ramis fasciculatae, breves, 3–4-florae. *Flores* pro genere magni, 5–8 cm. longi, singuli in alabastro bracteis binis basi connatis inclusi. *Calyx* campanulatus, 2 cm. longus, extra densissime lepidotus, intus glaber ; lobi deltoideo-ovati, 6–7 mm. longi. *Petala* rubra, reflexa, spathulata, ad 4·5 cm. longa, 1–1·5 cm. lata, apice oblique retusa, extra parce lepidota et pubescentia, intus glabra. *Columna staminea* in toto 4–6 cm. longa, inferne tubularis, superne in phalanges quinque 1·5–2·5 cm. longos divisa ; phalanges glomerulos antherarum stipitatos circiter 12 pinnatim dispositos gerentes ; antherae pro glomerulo 14–17, subglobosae vel transverse ellipsoideae, papillosae, poro terminali circulari vel rima elliptica dehiscentes. *Ovarium* setis numerosis squamas peltatas fimbriatas mox deciduas gerentibus dense tectum, 5-loculare ; stylus dense stellato-pubescens, staminum phalanges superans ; stigma parvum, capitatum ; ovula pro loculo bina, inaequialte affixa. *Fructus* depresso-globosus, dense spinosus, cum spinis 6–7 cm. diametro. *Semina* pro loculo 1–2, late ellipsoidea, circiter 2 cm. longa.

India : Burma ; Amherst District, *Manson* ; *Hewett in Herb. Lace* ; Thaton District, Dawna Range, *Lace*, 4633.

According to Beccari, Malesia, vol. iii. p. 253, the only constant difference between *Durio* and *Boschia* is in the shape and dehiscence of the anthers ; these are reniform in *Durio*, dehiscing by a long curved

slit, and subglobose in *Boschia*, opening by a terminal, circular or elliptic pore. Three stages in the evolution of the androecium may be traced in both genera: 1, stamens all free; 2, stamens united in five phalanges alternating with one or more free filaments; 3, stamens arranged in phalanges which are connate below in a staminal tube. The third type of androecium is characteristic of *Boschia Mansoni* and several species of *Durio*.—T. A. Sprague.

Fig. 1, back of petal with peltate scales; 2, group of anthers; 3 and 4, anthers; 5, longitudinal section of old ovary; 6, bristles on young ovary bearing deciduous peltate scales; 7, portion of style and stigma; 8, fruit. *All enlarged except* 8, *which is of natural size.*

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Tabula 3038.

IMPATIENS ALLANII, *Hook. f.*

Geraniaceae. Tribus Balsamineae.

I. Allanii, *Hook. f. in Kew Bull.* 1914, p. 325; a speciebus aliis birmanicis petalis lateralibus pro floris magnitudine maximis differt.

Herba humilis, glaberrima, erecta, paucifoliata, grandiflora, caule gracili laxe ramoso, internodiis elongatis. *Folia* opposita, ovata, apice acuminata, minute serrulata, basem versus rotundatam cuneatamve ciliata, 3–5 cm. longa, submembranacea, laete viridia, subtus pallida, nervis lateralibus utrinque 5–6, petiolata; glandulae intrapetiolares deficientes. *Inflorescentiae* in axi primario ramisque pedunculatae, pauciflorae; pedicelli graciles, 1–2 cm. longi; bracteae lanceolatae, longe acuminatae, 3–4 mm. longae, membranaceae, persistentes (?); flores ampli. *Sepala* duo lateralia lanceolata, longe acuminata, 8 mm. longa, membranacea, straminea, 3-nervia; sepalum posticum vexillare expansum, late trigonum, 11 mm. longum et latum, aureum, lateribus rotundatis in apicem acuminatum productis. *Petala* lateralia per paria in phyllum amplum bilobum 2·5–3 cm. longum et latum breviter stipitatum connata; lobus basalis minutus, varius, uncinatus, dilatatus vel deficiens; lobus distalis late dolabriformis vel semilunaris, apice acutus, pallide purpureus, basi stipiteque aureis; auricula dorsalis 0; petalum anticum lanceolatum, acuminatum, cymbiforme, 11 mm. longum, strictum, horizontale, lateribus involutis; calcar gracillimum, 3 cm. longum. *Filamenta* brevia, linearia; antherae didymae, obtusae, aureae. *Ovarium* ellipsoideo-oblongum, rectum, stigmatibus recurvis.*

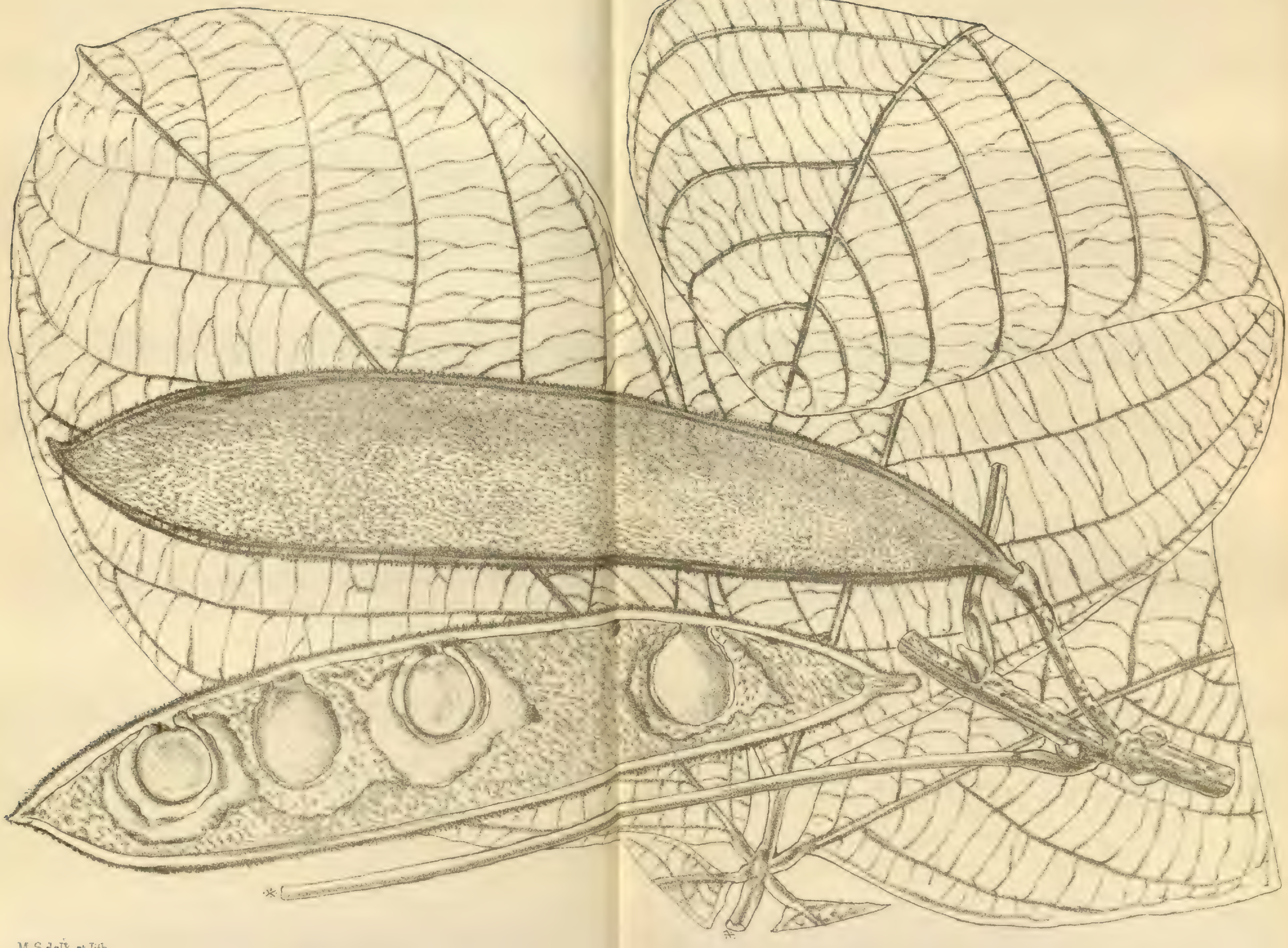
India: Burma; Henzada, S. Mayanaung Reserve at Kyibin Chaung, *C. W. Allan ex Hb. Lace.*

The remarkable species here figured was sent to me for the Kew

* This description, with the specimen described, accompanied by a drawing, was deposited in the Herbarium at Kew in 1911 by the late Sir Joseph Hooker, who expressed a wish that it might find a place in the Icones Plantarum. For reasons there given, the description has already been published in the Kew Bulletin for 1914. It is one of the last prepared by the distinguished author, who devoted much attention to and bestowed much study on the genus *Impatiens*.—Ed.

Herbarium by my excellent correspondent J. H. Lace, Esq., Chief of the Burmese Forest Department. I know of no species resembling it, and in the absence of fruit and seed it is impossible to determine its position in the Epitome of Burmese Balsams published in the Records of the Botanical Survey of India.—J. D. Hooker.

Fig. 1, bract; 2, lateral sepal; 3 and 4, vexillum flattened out and in natural position; 5, anticous petal; 6, lateral petal; 7, base of another lateral petal; 8, androecium; 9, pistil. *All enlarged.*



M.S. del? et lith.

Tabula 3039.

MILLETTIA SUBPALMATA, *Dunn.*

Leguminosae. Tribus Galegeae.

M. subpalmata, *Dunn in Kew Bull.* 1914, p. 207 : species a congeneribus foliis subpalmatis distincta.

Frutex vagans vel alte scandens, cortice conspicue lenticellato. *Folia* 2-juga, subpalmata, raro 1-juga, rhachi glabra 18 mm. longa, petiolo 14–17 cm. longo ; stipulae 1 cm. longae ; foliola obovata, apice subobtusa, superiora basi late subcuneata, 20–25 cm. longa, 13–15 cm. lata nervis lateralibus utrinsecus 10–12, inferiora breviora, 13–16 cm. longa, 11–12 cm. lata, omnia chartacea, supra glabra, subtus pubescentia, nervis venisque transversis subparallelis supra prominulis ; petioluli 8 mm. longi, crassi ; stipellae non visae. *Paniculae* axillares, breves, pauciflorae. *Flores* non visi. *Ovarium* 7-ovulatum. *Legumen* lineare, 12–19 cm. longum, 2·5–3·5 cm. latum, compressum, valvis lignosis elastice dehiscentibus dense molliter velutinis. *Semina* suborbicularia, nigro-fusca, complanata, circiter 13–14 mm. diametro.—S. T. Dunn.

India : Burma ; Aingdon-Kun Reserve, 100 m., *Lace,* 6104.

The description of this species, so remarkable on account of its subpalmate leaves, was drawn up by Mr. Dunn from the type specimen at Kew, which consists of a branchlet bearing one leaf and below it an infructescence of one pod only. Mr. Lace's own specimens show the same leaf character, but from his field notes it appears that there also occur 3-foliolate leaves, *i.e.* leaves with only one pair of lateral leaflets.—Ed.

M. S. delt et lith

Tabula 3040.

LONCHOCARPUS GRIFFONIANUS, *Dunn.*

Leguminosae. Tribus Dalbergieae.

L. Griffonianus, *Dunn in Journ. Bot.* vol. xlix. (1911), p. 15 ; a caeteris hujus generis speciebus floribus in paniculam ob ramos ad pulvillos redactos omnino racemiformem longam pendulam subsessilem dispositis distincta.

Frutex vel *arbor* ramis tortuosis pallidis. *Folia* 3(–5)-juga, ad 30 cm. longa, petiolo 6–8-plo longiora ; stipulae breves caducae ; foliola superiora lateralia ovata vel oblonga, acuminata, basi obtusa, 6–12 cm. longa, chartacea, firma, supra nitida, subtus pallide subglauca, venis marginem approximantibus 6–9-paribus patentibus ; petioluli 3–4 longi ; stipellae setaceae, 3 mm. longae. *Panicula* subsessilis, omnino racemiformis, axillaris, 10–20 (–30) cm. longa, caudiformis, pendula, rhachi basi breviter nuda ibique multibracteata. *Flores* intense purpurei, inodori, 1·2–1·5 cm. longi, in pulvillis 1–3-ni, secus rhachin dense vel rarius laxe dispositi, bracteati. *Calyx* late campanulatus, extra tenuiter pubescens, 4 mm. longus, dentibus ovatis, tubo 2–3-plo brevioribus ; pedicelli calyce fere duplo longiores, apice bibracteati. *Petala* glabra ; vexilli lamina late obcordata, basi biplicata ; alae basi breviter auriculatae ; carinae petala basi semicordata. *Stamina* diadelpha, vexillari libero basi geniculato. *Ovarium* lineare, pubescens, saepius 3-ovulatum. *Legumen* oblanceolatum, basi gradatim angustatum, 6–8 cm. longum, breviter pubescens, reticulatum, indehiscens, exalatum, 1–3-spermum.—*Millettia Griffoniana*, Baill. Adans. vol. vi. (1866) p. 222 ; Hiern, Cat. Welw. Afr. Pl. pars i. p. 225. *M. Thonningii*, Baker in Oliv., Fl. Trop. Afr. vol. ii. (1871) p. 128 (excl. syn. et typos pp.). *Derris leptorhachis*, Harms in Engl. Jahrb. vol. xxvi. (1899) p. 302.

West Tropical Africa : Guinea Coast ; without collector's name in *Herb. Kew.* Nigeria ; Lagos, *Moloney* ; banks of streams near Lagos ; Botanical Station, *Millen*, 129 ; Eppah, *Barter*, 3265 ; Onitsha, *Barter*, 1623 ; Oban district, *Talbot*, 1309 ; river at Old Calabar, *Mann*, 2282 ; Lokoja, *Shaw*, 14. Cameroons ; Batanga, common near water, *Bates*, 318 ; Bipinde, *Zenker*, 1609, 2491, 2659, 3386 ;

without precise locality, *Preuss*, 1155. Gaboon ; Como river, *Bates*, 487 ; Sibange Farm, Munda district, *Soyaux*, 101 ; Gaboon river, *Mann*, 977. Belgian Congo ; Bonjos Country, on the Oubangui river, *Chevalier*, 5042 ; Lisha, banks of river, *Hens*, ser. C, 335 ; without precise locality, *Christian Smith*. Angola ; Golungo Alto, near the river Luinha, *Welwitsch*, 1860–1861 ; Cazengo, between Luinha and Serra de Muxaûlo, *Welwitsch*, 1862.—S. T. Dunn.

The discovery of the fruit of this species necessitates its removal from either *Derris* or *Millettia* to *Lonchocarpus*.—S. T. Dunn.

Fig. 1, flower, corolla removed ; 2, vexillum ; 3, ala ; 4, carina ; 5, pistil ; 6, longitudinal section of ovary ; 7, fruit. *All enlarged except* 7, *which is of natural size.*

M. S. del^t et lith.

Tabula 3041.

THUNBERGIA BATTISCOMBEI, *Turrill.*

Acanthaceae. Tribus Thunbergieae.

T. Battiscombei, *Turrill*; species nova *T. Vogelianae*, Benth., affinis, sed foliis coriaceis apice rotundatis vel obtusis, inflorescentiis axillaribus, floribus usque ad 10, calyce annulato usque ad 1·5 mm. longo differt.

Herba erecta, 4·5–6 dm. alta (ex *Battiscombe*), caulibus tetragonis glabris. *Folia* ovato- vel obovato-elliptica, apice rotundata vel obtusa et leviter apiculata, basi leviter angustata vel subcordata, usque ad 11 cm. longa et 6 cm. lata, margine fere integra, costa et nervis in pagina utraque prominentibus, nervis lateralibus utrinque 3, petiolo saepissime 1·2 cm. longo. *Inflorescentiae* axillares, 10 cm. longae, circiter 10-florae, pedunculo 5 cm. longo glabro, pedicellis 1–1·5 cm. longis oppositis et decussatis pubescentibus; bracteae truncatae, fere obsoletae; bracteolae elliptico-ovatae, 2 cm. longae, 1 cm. latae, post anthesin accrescentes, acutae, utrinque pubescentes, nervis 3 ornatae, nervis transversis reticulationem prominentem formantibus. *Calyx* annulatus, circiter 8-lobus, usque ad 1·5 mm. longus, extra pubescens, intus glaber. *Corolla* oblique tubulosa, 4·5 cm. longa, coerulea, tubo basi 0·5 mm. diametro, 5 mm. supra imam basem constricto superne ampliato, fauce 1·5 cm. diametro, limbo 5-lobato. *Stamina* 4, antheris omnibus basi longe barbatis apice conspicue apiculatis 4 mm. longis, duo basi calcare recurvo instructa, duo altera ecalcarata; pollinis granula sphaeroidea, 70 μ diametro. *Discus* annulatus, carnosus, glaber. *Ovarium* subsphaeroideum, 2 mm. diametro, glabrum; stylus (stigmate incluso) 2·5 cm. longus; stigma infundibuliforme, antice fissum, angulis tribus acutis, anticis duobus barbellatis.

East Tropical Africa: Nyanza basin; 1200–1500 m., *E. Battiscombe*, 667.

The genus *Thunbergia* is usually divided into sections which are primarily based on the structure of the stigma and the type of inflorescence. The present plant should, from a consideration of these

characters, be placed in Lindau's section *Pseudohexacentris*, which was formed for the reception of a single species, *T. Vogeliana*, Benth., from West Africa. This last appears to be that with the greatest affinity to the species now described, though the marked difference in the calyces shows that the relationship is not a close one. Species of the section *Hexacentris* have sometimes axillary several- to many-flowered inflorescences like those of *T. Battiscombei* and typical *T. Vogeliana*, but, unlike these last, they have 2-lipped stigmas and are chiefly Asiatic, though one member, *T. amanensis*, Lindau, is known from East Africa.—W. B. Turrill.

Fig. 1, calyx and ovary; 2, corolla-tube, laid open, and stamens; 3, anthers without spurs; 4, anther with spur; 5, stigma; 6, transverse section of ovary. *All enlarged.*

M.S. delt. et lith.

Tabula 3042.

DICRAEA GARRETTII, *C. H. Wright.*

Podostemonaceae.

D. Garrettii, *C. H. Wright in Dyer, Fl. Trop. Afr.* vol. vi. sect. 1, p. 126 (anglice), *et in Kew Bull.* 1909, p. 213; ab *D. tenaci*, C. H. Wright, bracteis longe laceratis differt.

Caulis ad 10 cm. longus, ramosus, compressus, corneus. *Folia* laxe disposita, circiter 2 mm. longa, irregulariter lobata. *Flores* in fasciculos terminales dispositi; pedicelli ante anthesin inflexi basi sinuosi, demum 12 mm. longi; bracteae 6 mm. longae, basi vaginantes, parte superiore laceratae. *Perianthii* segmenta parva, linearia. *Filamenta* 4 mm. longa, ovarium superantia, ultra medium connata. *Ovarium* ellipsoideum, costatum; stigmata subulata; gynostemium 1 mm. longum. *Capsula* 1·75 mm. longa, 1 mm. diametro; valvae aequales, 3-costatae.

West Tropical Africa: Sierra Leone; Sherbro, *Garrett.*

This genus consists of seven species, five of which are natives of India, the other two of Tropical Africa. Of the latter *D. tenax*, C. H. Wright, has been collected at Livingstone Island, Victoria Falls, and differs from the plant here figured in having more numerous leaves, which are trilobed. Three other species have been transferred to *Leiothylax* on account of their smooth (not ribbed) capsules; these are:—*D. quangensis*, Engl. (=*L. quangensis*, Warming), *D. violascens*, Engl. (= *L. violascens*, C. H. Wright), and *D. Warmingii*, Engl. (= *L. Warmingii*, Warming).—C. H. Wright.

Fig. 1, branch bearing two flowers; 2, bract; 3, flower, showing arrangement of parts in bud; 4, stamens; 5, transverse section of ovary; 6, fruit; 7, fruit dehiscing. *All enlarged.*

M. S. delt. et lith.

Tabula 3043.

SERRURIA FLORIDA, *Knight*.

Proteaceae. Tribus Proteeae.

S. florida, *Knight Prot.* p. 92; *R. Br. in Trans. Linn. Soc.* vol. x. p. 126; *Roem. et Schultes, Syst. Veg.* vol. iii. p. 372; *Meisn. in DC. Prodr.* vol. xiv. p. 285; *Phillips et Hutchinson in Dyer, Fl. Cap.* vol. v. sect. 1, p. 678; species pedunculis monocephalis, capitulis magnis bracteis speciosis albis circumdatis valde distincta.

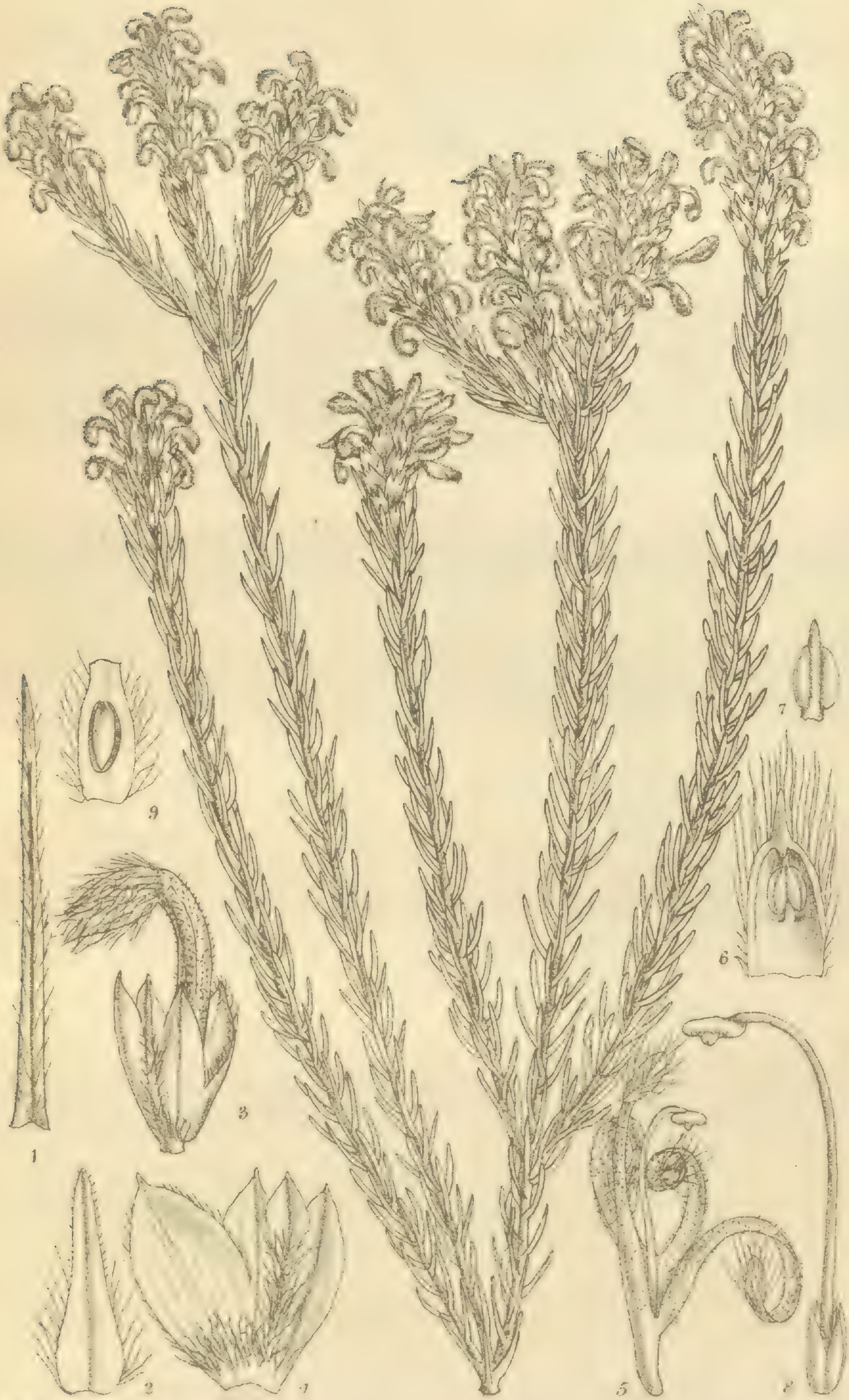
Frutex usque ad 3 m. altus; rami erecti vel adscendentes, teretes, purpureo-glaucescentes, glabri. *Folia* pinnatim vel bipinnatim divisa, 4·5–6·5 cm. longa, basi lata; segmenta acicularia, subteretia, acutissima, 0·5–0·75 mm. crassa, glabra. *Capitula* axillaria et terminalia, ad ramorum apices 3–6, pedunculata, 3–4 cm. longa, circiter 4 cm. diametro; pedunculi 2·5–7·5 cm. longi, glabri, bracteas magnas lanceolatas vel ovato-lanceolatas acutissime acuminatas albas glabras gerentes. *Involucri bracteae* speciosae, lanceolatae vel obovatae, acute acuminatae, 2·5–4 cm. longae, 0·8–1·5 cm. latae, membranaceae, albae, sicco roseo-flavae, glabrae. *Bracteae florales* lineares vel lineari-lanceolatae, ad apicem subulatum sensim angustatae, longe ciliatae, circiter 2 cm. longae. *Perianthii tubus* ellipsoideus, 3 mm. longus, glaber; segmenta 1 cm. longa, limbo excluso glabra; limbus oblongo-linearis, 3 mm. longus, pilis longissimis tenuiter villosus, segmento postico glabro vel fere glabro. *Antherae* 3 mm. longae. *Ovarium* pubescens, basi pilis longis circumdatum; stylus 7 mm. longus, basi tumidus, globoso-expansus, glaber; stigma oblongum, 2 mm. longum. *Fructus* oblongo-ellipsoideus, breviter rostratus, ferrugineo-pilosus.—*Protea florida,* Thunb. Diss. Prot. p. 15, t. 1, fig. 1; Murr. Syst. Veg. ed. xiv. p. 136; Lam. Ill. vol. i. p. 240; Willd. Sp. Pl. vol. i. p. 506; Poir. Encycl. vol. v. p. 662; Thunb. Fl. Cap. ed. Schultes, p. 121.

South Africa: Cape Colony; Paarl Division, French Hoek, *Thunberg*; *Masson*; *Mac Owan,* 1524; *Kriel in Herb. Bolus,* 6335; without precise locality, *Wedgwood.*

The genus *Serruria* embraces about 50 species, all of which are

confined to the South Western Region of Cape Colony. From an ornamental point of view, *S. florida* is by far the most handsome. In the section *Monocephalae*, which is characterised by the simple axillary peduncles, it may be readily recognised by its large and beautiful snow-white bracts surrounding the flowers. Another peculiar feature of the species, which is present also in a few others, is that the limb of the posticous perianth-segment is glabrous or nearly so, whereas those of the lateral and anticous segments are adorned on the back with a beard of long hairs. The plant appears to be of very restricted distribution, having so far been found only in the neighbourhood of French Hoek.—J. HUTCHINSON.

FIG. 1, floral bracts; 2, perianth; 3, perianth-limb and anther; 4, pistil; 5, longitudinal section of ovary; 6, fruit. *All enlarged.*



M.S. del^t et lith.

Tabula 3044.

SPATALLA SQUAMATA, *Meisn.*

Proteaceae. Tribus Proteeae.

S. squamata, *Meisn. in DC. Prodr.* vol. xiv. p. 310; *Phillips et Hutchinson in Dyer, Fl. Cap.* vol. v. sect. 1, p. 688; species involucris 1-floris plus minusve membranaceis extra subglabris, labio infero intra in costa media dense piloso, segmentis anticis spiraliter contortis limbis reflexis distinctissima.

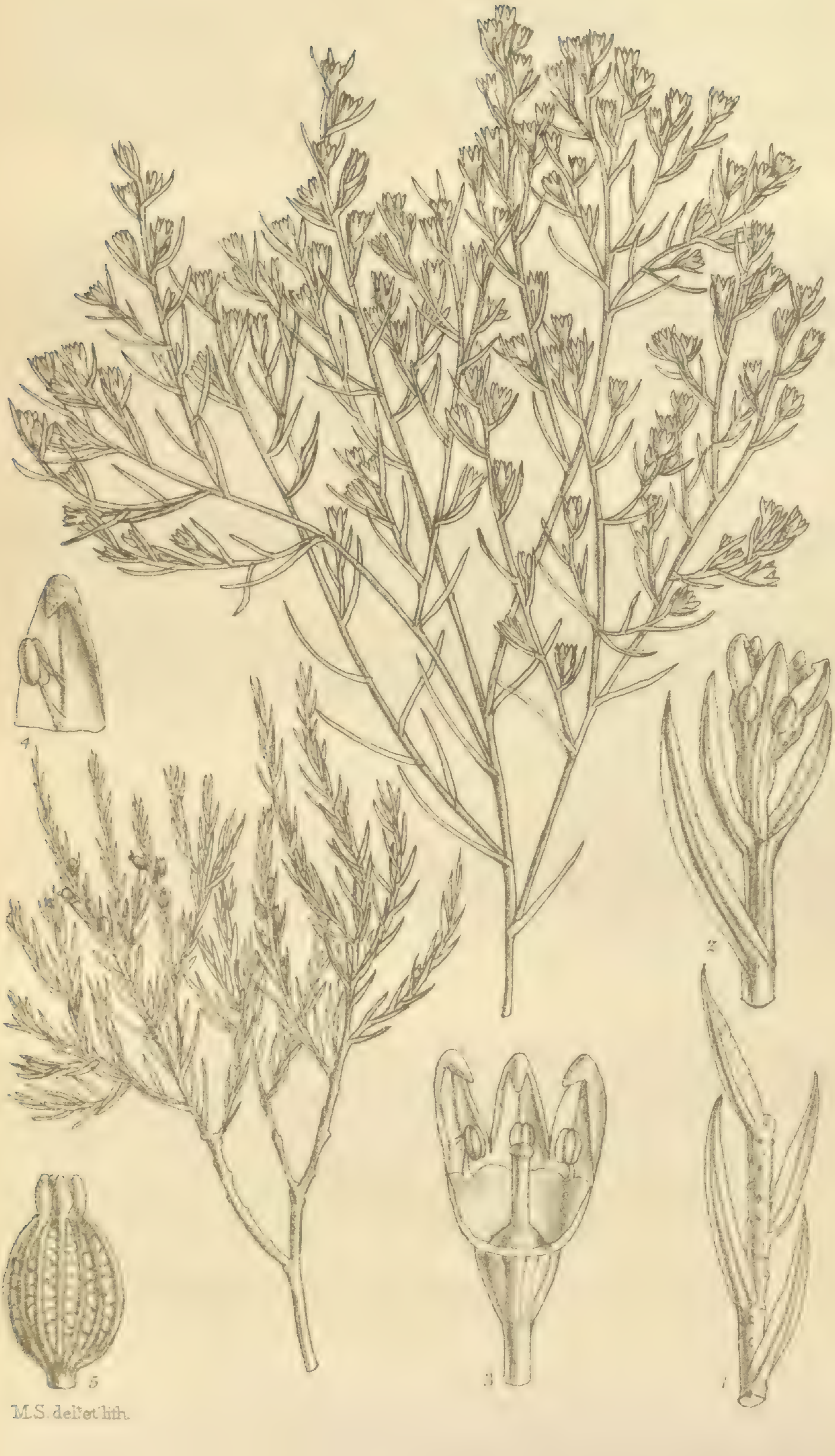
Frutex parva. *Rami* teretes, graciles, tenuiter pilosi vel fere glabri. *Folia* dense imbricata, adscendentia, linearia, acuta, 6–8 mm. longa, circiter 0·75 mm. crassa, glabra vel parce pilosa. *Involucra* 1-flora in spicas terminales solitarias vel 2–3-natas sessiles 1–3 cm. longas disposita, bilabiata, 5–6 mm. longa, plus minusve membranacea, extra tenuiter pilosa vel fere glabra; labium superum ovatum, integrum, inferum tridentatum, trinervium, intus in costa media linea pilorum instructum, dentibus ovatis subacutis 1 mm. longis; bracteae subtendentes lineares vel lanceolatae, subacute acuminatae, 5 mm. longae, membranaceae vel squamosae, extra glabrae vel fere glabrae, ciliatae. *Perianthii tubus* 1 mm. longus, glaber; segmenta 7·5 mm. longa, anticis tribus spiraliter contortis et limbis reflexis, segmento postico recto; ungues pilis crispis breviter pubescentes; limbus ovatus, 1·5 mm. longus, apice appendiculo longo carnoso terminatus, extra villosus. *Antherae* 0·75 mm. longae, appendiculatae. *Squamae hypogynae* 3, ovato-lanceolatae, 0·75 mm. longae, carnosae, glabrae. *Ovarium* 1 mm. longum, pilosum; stylus 6·5 mm. longus, subteres; discus stigmaticus obovatus, 1 mm. longus, medio conicus. *Fructus* non visus.

South Africa: Cape Colony; Bredasdorp Division, Koude River, *Schlechter*, 9612; near Elim, *Bolus*, 7666, 7867; without locality, *Thom*, 164; *Ludwig*.

Spatalla is a genus of small erect or spreading Proteaceous shrubs endemic to the Cape, and with a single exception, *S. barbigera*, Knight, confined to the South Western Region of the Colony. *S. barbigera* extends into the Prince Albert Division in the Karroo. The genus

as defined in the Flora Capensis contains 21 species, but as understood by the earlier authorities, such as R. Brown and Meisner, it embraced 5 others, two of which occur in the Karroo. These five species have been made by Phillips the types of a separate genus, *Spatallopsis*, on account of their strictly actinomorphic as opposed to slightly zygomorphic perianth, and of slight differences in the ovary and stigmatic disk. The species here figured, *S. squamata*, Meisn., is remarkable in the genus *Spatalla* in having conspicuous, more or less membranous, glabrescent involucres, which are provided with a curious line of hairs inside below the middle lobe; another distinct feature is the spirally coiled and reflexed anticous (abaxial) perianth segments with their long-appendaged limbs.—J. HUTCHINSON.

FIG. 1, leaf; 2, bract subtending the involucre; 3, involucre and flower in bud; 4, involucre laid open, showing the line of hairs below the middle lobe; 5, perianth; 6, upper part of perianth limb; 7, anther; 8, pistil; 9, longitudinal section of ovary. *All enlarged.*



M.S. del.et lith.

Tabula 3045.

THESIUM COSTATUM, *A. W. Hill.*

Santalaceae. Tribus Thesieae.

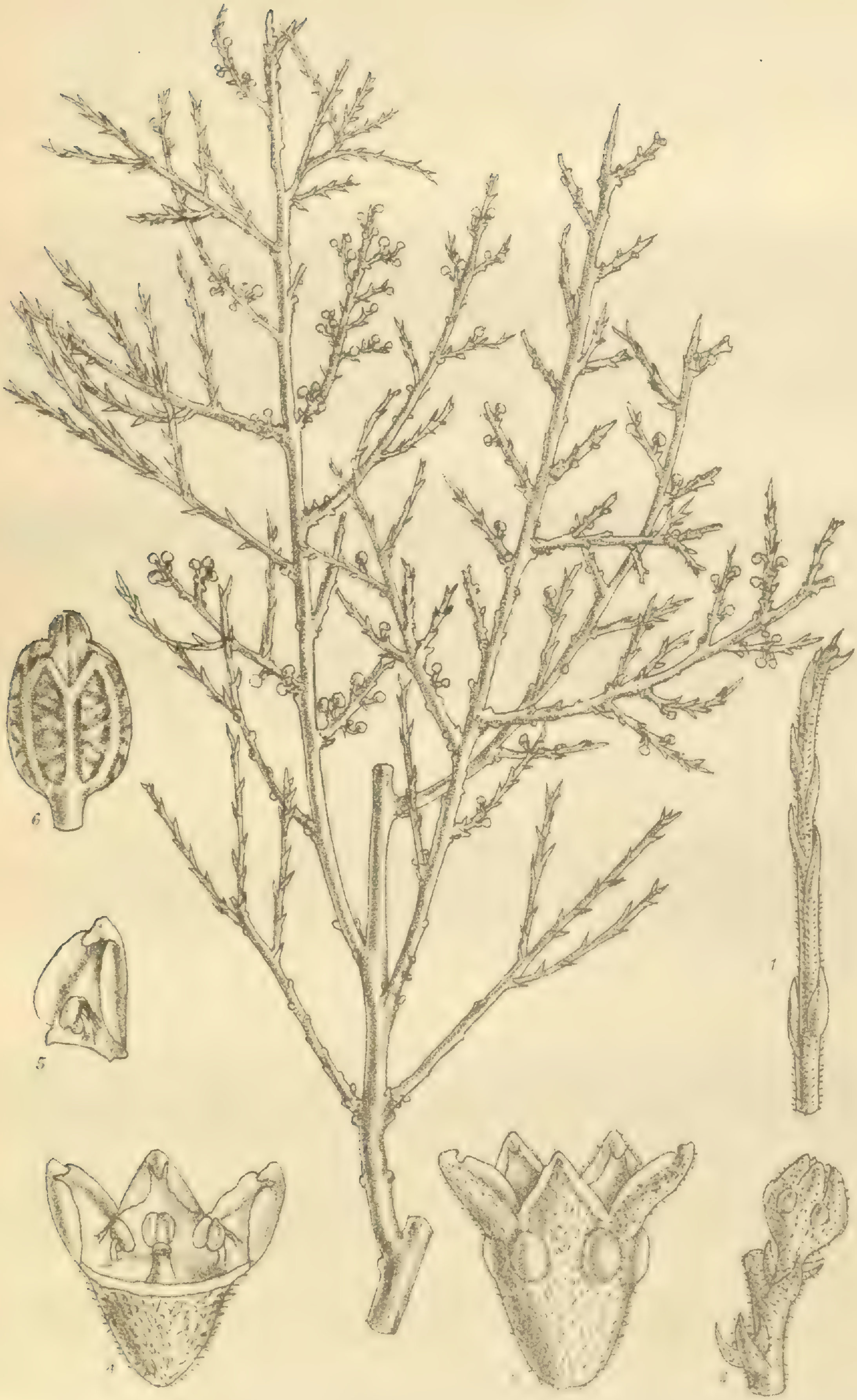
T. costatum, *A. W. Hill in Kew Bull.* 1915, p. 25; species *T. racemoso*, Bernh., affinis, foliis costatis rigidis, floribus pedunculatis distinguenda.

Rhizoma gracile, erectum; caules pauci vel subnumerosi, superne ramosi, costati vel angulares, glabri. *Folia* laxe disposita, linearia, acute acuminata, 0·6–1·2 cm. longa, plana, utrinque costa prominente, glabra. *Cymulae* 1–3-florae. *Bracteae* pedunculo breviter adnatae, 0·6–1 cm. longae, ceterum foliis similes; pedunculi bracteis breviores vel paulum longiores, compressi, subgraciles; bracteolae floribus breviores vel longiores, lineares, acutae, glabrae. *Perianthium* 2·5–3 mm. longum; segmenta triangulari-lanceolata, 1·5 mm. longa, cucullata, marginibus fimbriatis membranaceis, cucullo rostrato et leviter papilloso. *Antherae* 0·75 mm. longae. *Stylus* 1·5 mm. longus, antheris superans. *Fructus* campanulato-globosus, perianthio persistente incluso circiter 6 mm. longus, prominenter 10-costatus, inter costas crasse reticulatus.

South Africa: Orange River Colony; Bethlehem, *Richardson*; Basutoland; Leribe, December, *Dieterlen*, 647; Transvaal; near Pretoria, November, *Wilms*, 1308a; Swaziland; near Bremersdorp, 780 m., January, *Bolus*, 12273; near Mbabane, 1410 m., January, *Bolus*, 12277; Griqualand East; *Tyson*. Natal; near Camperdown, 1000 m., December, *Schlechter*, 3284; Weenen, 1050 m., January, *Wood*, 3582; between Pietermaritzburg and Greytown, November, *Wilms*, 2252; near Pietermaritzburg, *Wilms*, 2254; near Emberton, December, *Schlechter*, 3239; Inanda, *Wood*, 1141; without precise locality, *Gerrard*, 1281.

The perianth-segments are glabrous and the species belongs to the section *Imberbia*, sub-section *Subglabra*, of the genus *Thesium*. The rigid, ribbed leaves and bracts serve to distinguish *T. costatum* from allied species.—A. W. Hill.

Fig. 1, piece of stem with leaves showing ribs; 2, a flower and bracteoles, the external glands are well seen; 3, a flower dissected to show the glabrous, hooded perianth-segments, the disk, stamens, and pistil; 4, a perianth-segment with hairs attached to anthers; 5, a fruit with persistent perianth and prominent ribs and reticulations. *All enlarged.*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M. S. delt et lith.

Tabula 3046.

THESIUM LACINULATUM, *A. W. Hill.*

Santalaceae. Tribus Thesieae.

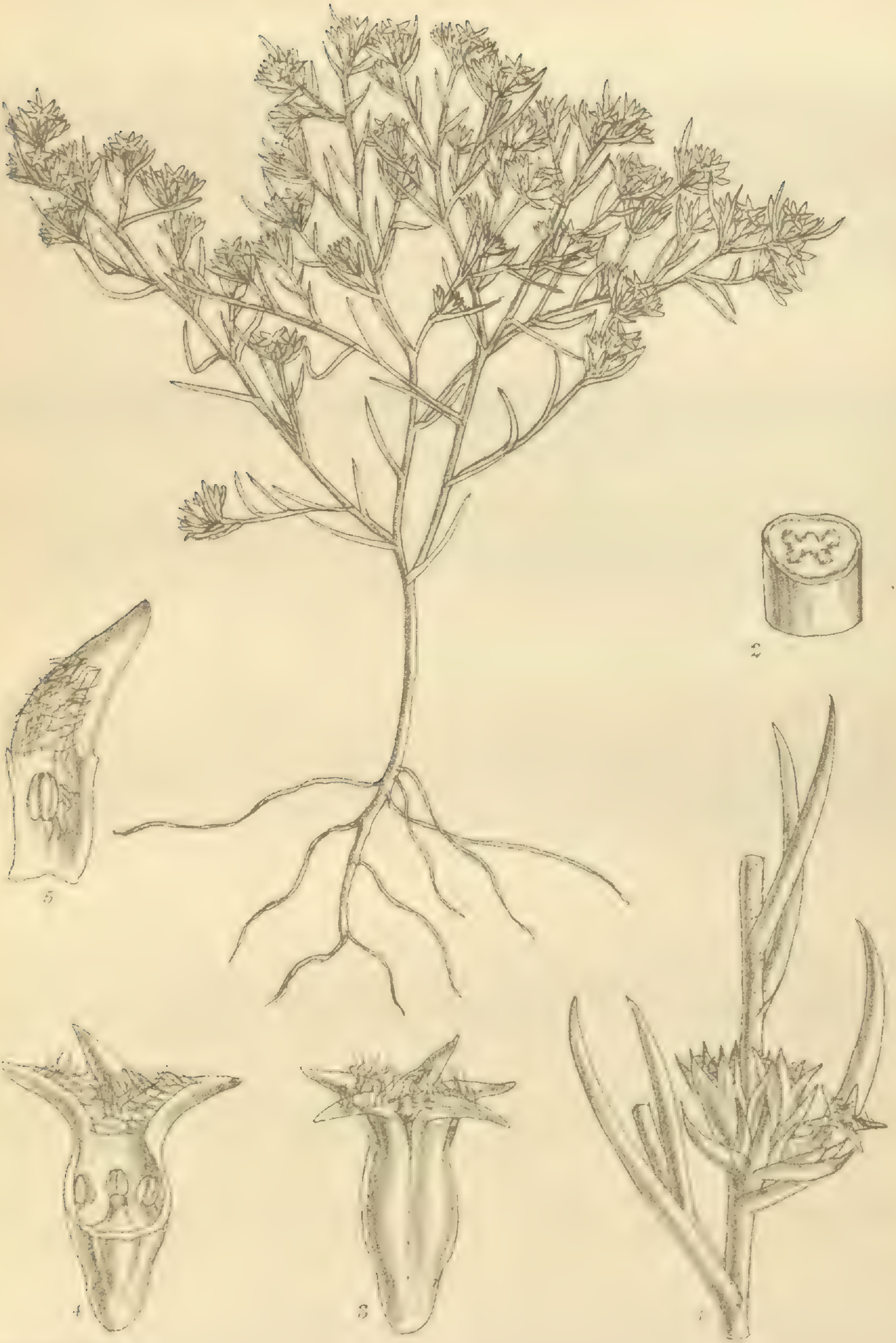
T. lacinulatum, *A. W. Hill in Ann. Bolus Herb.* ined.; *Kew Bull.* 1915, p. 33; species *T. rigido*, Sonder, quoad habitum similis ramis et floribus minute puberulis segmentis perianthii lacinulatis distincta.

Suffrutex perennis, circiter 30 cm. altus, omnino indumento minute puberulo obtectus, ramis et ramulis rigidis apice spinosis. *Folia* squamiformia, ramis appressa, subulato-lanceolata, 1·5–2 mm. longa, apice fusca. *Flores* axillares, solitarii, subsessiles; bracteae squamiformes, floribus multo breviores, bracteolae subulatae, cartilagineae, circiter 0·65 mm. longae. *Perianthium* 1·75 mm. longum, extra hirsutum, segmentis 1 mm. longis ovatis subacutis patentibus marginibus lacinulis membranaceis inflexis instructis. *Antherae* 0·4 mm. longae, segmentorum perianthii basin insertae. *Stylus* 0·25 mm. longus, conicus. *Fructus* ovoideo-globosus, 2·5 mm. longus, viridis, puberulus, costis 10 distinctis et reticulationibus inconspicuis instructus.

South Africa: Great Namaqualand; Great Karasberg, *Pearson*, 7805.

This species and *T. pleuroloma*, A. W. Hill, belonging to the section *Imberbia*, sub-section *Fimbriata*, of the genus, are peculiar among South African species in having the margins of the perianth-segments provided with lateral lacinulae. *T. lacinulatum* is further distinguished from other spinous species by being clothed with minute hairs, including both perianth-segments and receptacle.—A. W. Hill.

Fig. 1, a young shoot covered with minute hairs; the leaves are closely adpressed to the stem; 2, a flowering shoot showing the small bracts and bracteoles and flower covered with minute hairs, the flower is provided with external glands; 3, a flower enlarged, the external covering of hairs, glands, lacinulae and apical hood of the perianth-segments are well seen; 4, a flower dissected to show the marginal flaps of lacinulae of the perianth-segments and the apical hood; 5, a perianth-segment, the perianth hairs attached to the back of the anther at its apex are shown; 6, a fruit with ribs and reticulations. *All enlarged.*



M.S.del.t et lith.

Tabula 3047.

THESIUM ACUMINATUM, *A. W. Hill.*

Santalaceae. Tribus Thesieae.

T. acuminatum, *A. W. Hill in Kew Bull.* 1915, p. 22; species distincta *T. capituliflora*, Sond., similis, perianthii segmentis apice longe acicularibus repandis dense barbatis, foliisque acicularibus differt.

Rhizoma gracile, erectum, subteres, circiter 3·5 mm. crassum; caules e rhizomate numerosi, patuli vel adscendentes, subteretes, glabri. *Folia* acicularia, acuta, 0·8–2·5 cm. longa, subteretia, glabra. *Flores* in glomerulos subdensos terminales dispositi. *Bracteae* triangulari-lanceolatae, acutae, carnosae, 2–3 mm. longae, glabrae; bracteolae floribus circiter dimidio breviores. *Perianthii segmenta* 1·5 mm. longa, lineari-lanceolata, apice longe acicularia, repanda, inferne dense adpresse barbata. *Antherae* ad perianthii tubi basin inclusae, 0·5 mm. longae. *Stylus* 0·25 mm. longus. *Fructus* ovoideo-globosus, circiter 4 mm. longus, tenuiter costatus et reticulatus.

South Africa: Cape Colony; Cape Division, near Noah's Ark Battery, Simonstown, September, *Wolley Dod*, 2806, 3016; Simon's Bay, *Wright*, 536; hills west of Simonstown, October, *Wolley Dod*, 1879; Muizenberg, 320 m., August, *Bolus*, 8040; Constantiaberg, 550 m., *Schlechter*, 543; Steenberg Flats, July, *Wolley Dod*, 2741; 'Cape,' *Hooker*, 608; *Reynoud ex herb. Kunth. in herb. Berol.*

The spreading perianth-segments with their elongated acicular tips are a marked feature of this species, which belongs to the section *Barbata*, the perianth-segments being provided with a dense apical beard.—A. W. Hill.

Fig. 1, a piece of stem showing the acicular leaves and a small inflorescence; 2, a leaf in section; 3, a flower showing the spreading perianth-segments; 4, a flower dissected, the anthers are included in the tube; 5, a perianth-segment with portion of tube; the segments have long acicular tip and dense apical beard, the anther attachment hairs are also shown. *All enlarged.*

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M.S. delt et lith.

Tabula 3048.

THESIUM PENICILLATUM, *A. W. Hill.*

Santalaceae. Tribus Thesieae.

T. penicillatum, *A. W. Hill in Kew Bull.* 1915, p. 37; species a speciebus alteris pilorum discretorum penicillo pone antheras sito et ab eis distincto distinguenda.

Caules erecti, longitudinaliter sulcati, robusti, lignosi, glabri, superne ramosi; rami erecti, subcorymbosi. *Folia* linearia, acute mucronata, 2·5–3 cm. longa, circiter 2 mm. lata, infra carinata, glabra, sicco rugosa. *Flores* in corymbos densos terminales usque ad 2·5 cm. diametro dispositi. *Bracteae* purpurascentes, lineari-oblongae, subacutae, carinatae, flores aequantes, ad 2 mm. latae, marginibus subtranslucentibus; bracteolae bracteis paullo breviores. *Perianthium* 2·25 mm. longum; segmenta lineari-lanceolata, subacuta, circiter 2·25 mm. longa, plana, cucullata, apice et marginibus pilis longis instructa. *Antherae* 0·25 mm. longae, in perianthii tubo inclusae, pilorum discretorum penicillo pone antheras sito et ab eis distincto. *Stylus* 0·25 mm. longus vel subnullus. *Fructus* robuste et breviter stipitatus, ellipsoideus, 6 mm. longus, subprominenter 5-costatus, nervis intermediis inconspicuis, inter nervos transverse reticulatus.

South Africa: Cape Colony; George Division, Cradock Berg, 760 m., *Galpin*, 4546; Humansdorp Division, Storms river, 80 m., *Schlechter*, 5986.

This species is the sole representative so far observed of the newly constituted section *Penicillata*. The hairs behind the anthers are quite free, forming a loose pencil, and are not attached to the anthers in any way. The specimen figured is *Galpin*, 4546.—A. W. Hill.

Fig. 1, a cymule detached from a corymb showing the central flower and developing lateral flowers with bract and bracteoles; 2, a flower dissected to show the apical beard of hairs and the pencil of free hairs behind each anther; 3, apex of a perianth-segment showing hairs of the beard and those on the margin. *All enlarged.*

M. S. del.t et lith.

Tabula 3049.

THESIUM AGGREGATUM, *A. W. Hill.*

Santalaceae. Tribus Thesieae.

T. aggregatum, *A. W. Hill in Kew Bull.* 1915, p. 22; species *T. diversifolio*, Sond., et *T. spicato*, L., affinis, ab illa bracteis margine fimbriatis, ab hac foliis superioribus paucis subulatis ascendentibus praecipue differt.

Caules et rami adscendentes, subteretes, glabri. *Folia* parva, plana, ad caulem adpressa, lanceolata vel lineari-lanceolata, acuta, 3–4 mm. longa, rigida, sicco nigrescentia, glabra. *Flores* in capitulos terminales subcapitatos vel in spicas oblongo-lineares conferti. *Bracteae* ovatae, acute acuminatae, costa lata carnosa, marginibus subtranslucentibus viridibus lacerato-denticulatis, glabrae; bracteolae floribus aequales sed multo angustiores, ceterum eis similes. *Perianthium* 3–4 mm. longum, intra faucem pubescens; segmenta circiter 3 mm. longa, linearia, subacuta, apice rigide pectinato-barbata. *Antherae* e perianthii tubo exsertae, 0·5 mm. longae. *Stigma* sessile. *Fructus* ellipsoideus, 6 mm. longus, prominenter 10-costatus, inter costas subtiliter reticulatus.

South Africa: Cape Colony; Vanrhynsdorp Division, Windhoek, 305 m., August, *Schlechter*, 8348; Clanwilliam Division, Lammskraal, 375 m., September, *Diels*, 779; Malmesbury Division, near Hopefield, September, *Bachmann*, 1649, 1695; Darling, 30 m., October, *Schlechter*, 5337; Cape Division, near Capetown, 30 m., June, *Bolus*, 1360; Wynberg, October, *Bolus*, 2931; 25 m., February, *Schlechter*, 7545; Muizenberg, 300 m., January, *Bolus*, 2933 partly; Kenilworth, 30 m., January, *Bolus*, 7049; Hertzog House Retreat, December, *Wolley Dod*, 2364; near Vygerskraal, December, *Wolley Dod*, 2371; without precise locality, *Wallich*; *Osbeck in Herb. Stockholm*; *Zeyher*, 4879.

This species is taken as a type of the section *Annulata* in which there is a ring of short downwardly directed golden hairs inserted in the perianth-tube at the level of the attachment of the anther-filaments. The perianth-segments are provided with a beard of rigid hairs but there are no perianth-hairs behind the anthers. The specimen figured is *Bolus*, 7049.—A. W. Hill.

Fig. 1, a flower detached, with bract and bracteoles; the bract and bracteoles are ribbed and the margins are denticulate; 2, a bract showing prominent denticulation at the base; 3, a flower to show the external glands alternating with the perianth-segments; 4, a flower dissected to show the rigid comb-like hairs of the apical beard and the ring of hairs at the throat of the perianth-tube; 5, a single perianth-segment showing the beard and throat-hairs in greater detail; 6, a fruit surmounted by the persistent perianth, the ribs and reticulation are prominent. *All enlarged.*

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M S del^t et lith

Tabula 3050.

POPULUS DENHARDTIORUM, *Dode.*

Salicaceae.

P. Denhardtiorum, *Dode in 'Bull. Soc. Dendr. 'France,* 1909, p. 152 ; affinis *P. euphratico,* Oliv., sed racemis ♀ brevibus, perianthio multo magis diviso, ovario majusculo, stigmate maximo plane distincta.

Arbor 18–30 m. alta ; truncus cortice albido laevi vel tandem obscurato profunde fisso tectus ; ramuli juniores steriles superne parce albo-pubescentes, mox glabrati, cortice exsiccato brunneo vel fuscescente, brachyblastici florentes canescenti-pubescentes, tandem glabrati. *Gemmae* ovoideae, glabrae, resinoso-viscosae. *Folia* ovata, elliptica, rarius rotundata vel ovato-lanceolata, basi breviter vel brevissime cuneata, rarius late rotundata vel subtruncata, utrinque grosse 3-dentata, dentibus acutissimis patentibus, apice triangulari acuto vel acutissimo producto vel brevi, 3–5 (raro 8) cm. longa, plerumque 3 cm. lata, primo pube tenui canescentia, citissime glabrata, matura plerumque glaberrima, subcoriacea, glauca, ima basi utrinque glandula notata, nervis lateralibus utrinsecus 5–6 alternatim in dentium apices percurrentibus, venarum rete laxiusculo plerumque plus minusve prominulo ; petioli graciles, 1–3 cm. longi, primo dense pubescentes vel tomentosi, citissime glabrati. *Stipulae* lineari-filiformes, 3 mm. longae, caducissimae. *Amenta* ♂ e ramis annotinis orta, basi aphylla, 8–10-flora, 1·5–2 cm. longa ; rhachis gracilis, pilosula ; bracteae spatulato-cuneatae, superne inaequaliter dentatae, tenuiter membranaceae, 3–4 mm. longae, caducissimae ; pedicelli filiformes, 2 mm. longi. *Perianthium* membranaceum, profunde inaequaliter multilaciniatum, laciniis linearibus. *Stamina* circiter 30 ; antherae filamentis paulo longiores, 1·5–1·7 mm. longa. *Amenta* ♀ ramulos brachyblasticos e ramis annotinis ortos terminantia, laxa, 2–2·5 cm. longa, 4–6-flora, ramulis suffulcientibus 1 cm. longis vel brevioribus unifoliatis uti rhachi racemi et pedicellis sub anthesi dense incano-pubescentibus, deinde glabratis ; bracteae obovatae vel spatulatae, irregulariter dentatae, tenuiter membranaceae, caducae, ad 6 mm. longae ; pedicelli 3–4 mm. longi. *Perianthium* in lacinias simplices vel ad medium 2–3-partitas fissum, laciniis vel lacinulis filiformibus. *Ovarium* sub anthesi ovoideum, estipitatum, 3–3·5 mm. longum, dense

incano-tomentosum. Stylus 1·5 mm. longus; stigmata ambitu late cuneata, ad 7 mm. longa, ad medium vel paulo ultra bifida, lobis inaequaliter 2–3-lobis. *Capsula* ovoidea, basi rotundata, subacuta, valvis expansis 6–12 mm. longis verruculosis pube tenui adpressa. *Semina* albo-tomentella, 1·25–1·75 mm. longa, lana 7–8 mm. longa.—*P. euphratica*, subsp. *Denhardtiorum*, Engl. in Notizbl. Bot. Gart. Berlin, vol. ii. p. 218 (1898); Veget. Somaliland. (in Sitzungsber. Preuss. Akad. Wiss. 1904, p. 15; Bot. Jahrb. vol. xxxvi. p. 252 (1905); Aschers. in Ber. Deutsch. Bot. Gesellsch. vol. xxvi. a (1908) p. 360).

East Tropical Africa: British East Africa; along the Tana River, from 450 m. to sea-level, *Battiscombe*, 207; Korokoro (according to Engler), *Thomas*; Witu, *Thomas*, 49; near the Athi and Tsarvo Rivers, *Hildebrandt*, 2608.

This species, which was discovered by Hildebrandt in 1877 and then found again by F. Thomas in 1896, was more recently (1910) collected by Mr. E. Battiscombe in excellent specimens from which the above description has been drawn up. They are accompanied by the following note:—"207 Tana River. Poplar Tree. Deciduous. Very abundant on the banks of the river. Grows to a height of 60–80 feet, average 70 feet. Bark at first smooth, white, on old trees the bark is dark in colour, rough with deep fissures; petioles twisted so that the leaves hang vertically. Wood soft, light, about 25 lbs. a cubic foot, heartwood light brown. Coppices freely. Used by natives for 'dug-out' canoes. Altitude from 1500 feet to sea-level."

This is so distinct from all the forms which, on the basis of a wide conception of species, might be included under *Populus euphratica* that it cannot be merely added to them as a variety or subspecies.—O. Stapf.

A, male branch: Fig. 1, bract; 2, flower; 3, stamens. B, female flowering branch: Fig. 4, flower. C, fruiting branch: Fig. 5, fruiting raceme; 6, seed. *All enlarged except* A, B, C *and* 5, *which are of natural size.*

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Tabula 3051.

DRIMYS ELONGATA, *Ridl.*

Magnoliaceae. Tribus Wintereae.

D. elongata, *Ridley in Trans. Linn. Soc. Bot.* ser. 2, vol. ix. ined.; species nova ramis longis tenuibus, floribus longe pedicellatis ut videtur roseis distinctissima.

Frutex ramis gracilibus. *Folia* alterna, obovata, spathulata, obtusa, basi angustata, 3·5 cm. longa, 1 cm. lata, coriacea, nervis 5-jugis tenuibus vix conspicuis intra marginem anastomosantibus; petioli 2 mm. longi. *Flores* extra-axillares, solitarii, pedunculis 2 cm. longis gracilibus. *Sepala* 2, ovato-orbicularia, cymbiformia, 5 mm. longa. *Petala* 6, oblonga, basi angustata, apice obtusa, 1·8 cm. longa, 0·7 cm. lata. *Stamina* 30, exteriora quam interiora dimidio breviora; filamenta crassa; antherae basifixae, loculis ad basin divaricatis. *Pistillum* unicum, cylindricum, uniloculare, stigmate sessili, laterali.—H. N. Ridley.

New Guinea: Mt. Carstensz, 750–1650 m., *C. B. Kloss.*

Fig. 1, flower, petals removed; 2, stamens and pistil, some of the stamens removed; 3, stamens; 4, pistil. *All enlarged.*

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M.S del^{t} et lith.

Tabula 3052.

AGLAIA RUBRA, *Ridl.*

Meliaceae. Tribus Trichilieae.

A. rubra, *Ridley in Trans. Linn. Soc. Bot.* ser. 2, vol. ix. ined.; species nova affinis *A. simplicifoliae,* Harms, a qua foliorum sessilium majorum forma, nervis horizontalibus, calyce minore, petalis brevioribus latioribus, ovario glabro recedit.

Frutex vel *arbor.* *Folia* in apicibus ramorum congesta, subopposita, sessilia, simplicia, oblanceolata, acuminata, basi obtusa, 18–24 cm. longa, 4–8 cm. lata, tenuiter coriacea, in sicco grisea, supra pilis fasciculatis tecta, subtus nervis horizontalibus 30 elevatis, costa utrinque hirta, nervis pilis fasciculatis rufo-brunneis deciduis tectis. *Panicula* terminalis, foliis brevior, 8 cm. longa, ramis brevibus laxifloris hirtis; pedicelli 1 mm. longi, hirti. *Flores* rubri, 1 mm. longi. *Sepala* 5, brevia, ovata, rotundata. *Petala* imbricata, coriacea, elliptica, obtusa. *Stamina* 5, in tubum subglobosum connata, extra glabra; antherae oblongae, introrsae, loculis subparallelis hirtis. *Ovarium* conico-ovoideum, subangulatum.

New Guinea: Mt. Carstensz, 150 m., *C. B. Kloss.*

The nerves of the leaves are covered at first with small tufts of brown woolly hairs, which soon fall off, leaving a curious undulate appearance on the nerves.—H. N. Ridley.

Fig. 1, part of lower surface of leaf; 2, stellate hair; 3, part of inflorescence; 4, section of flower; 5, section of staminal tube and pistil; 6, anthers. *All enlarged.*

ot lith.

Tabula 3053.

GEISSOIS IMTHURNII, *Turrill.*

Saxifragaceae. Tribus Cunonieae.

G. Imthurnii, *Turrill in Journ. Linn. Soc.* 1915, vol. xliii. p. 19; species *G. ternatae*, A. Gray, affinis, sed foliolis fere sessilibus pagina utraque pubescentibus facile distinguenda.

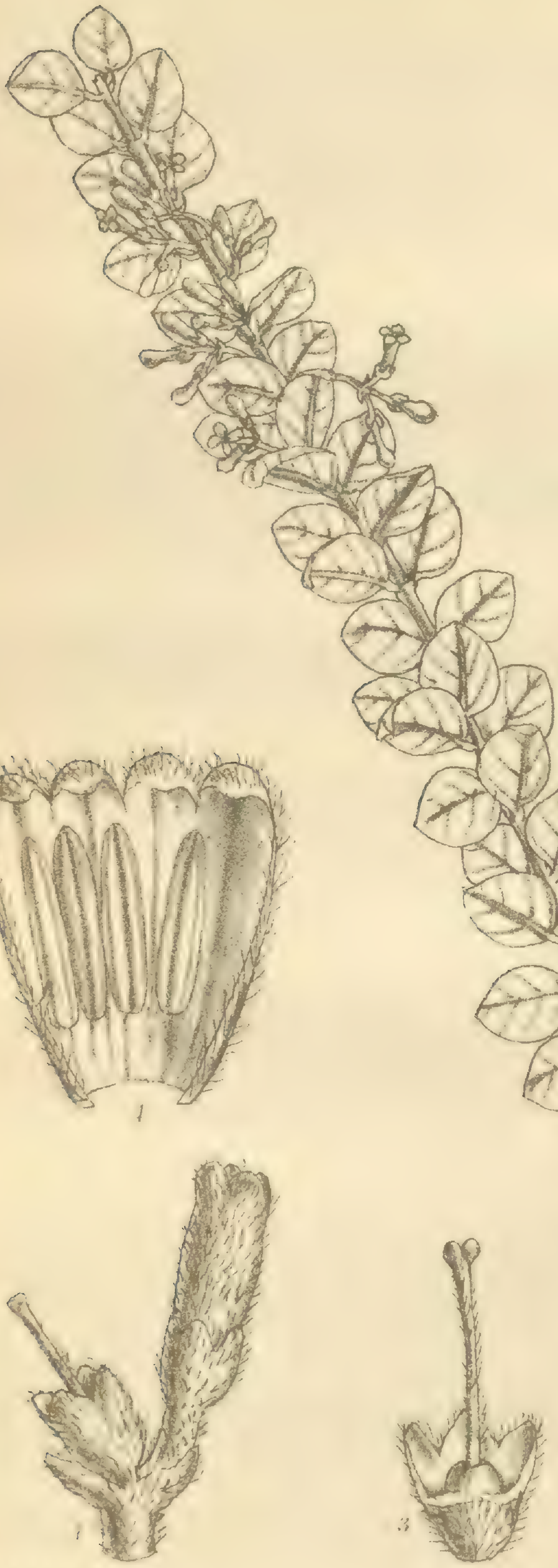
Arbor ramis teretibus junioribus dense adpresse pubescentibus. *Folia* trifoliolata, petiolo usque ad 2 cm. longo suffulta; foliola fere sessilia, obovata, apice rotundata, basi subacuta vel subrotundata, usque ad 9 cm. longa, 5 cm. lata, subcoriacea, integra, nervis lateralibus utrinque 12–15, pagina utraque pubescentia. *Inflorescentia* leviter pubescens, racemis lateralibus solitariis vel 2–3 aggregatis circiter 4·5 cm. longis usque ad 15-floris pedunculo communi usque ad 1·5 cm. longo suffultis; pedicelli circiter 5 mm. longi; bracteae 1·5 mm. latae. *Sepala* 4, ovato-lanceolata vel oblongo-lanceolata, subacuta, 6 mm. longa, 2·5 mm. lata, coriacea, pagina utraque leviter pubescentia. *Petala* 0. *Stamina* 7–10, filamentis 1·6 cm. longis, antheris 1·25 mm. longis. *Discus* annularis, crenatus, 1 mm. altus. *Ovarium* oblongo-conicum, 3 mm. altum, 1·25 mm. diametro, glabrum; styli duo, 9 mm. longi.

Polynesia: Fiji; Viti Levu; Nandarivatu, in flower March 7, 1906, *im Thurn*, 137.

The genus *Geissois* contains nearly a dozen known species, all of them endemic in Australasia. The majority are natives of New Caledonia, one (*G. Benthami*, F. Muell.) is described from Queensland, and one from the New Hebrides, but till now *G. ternata*, A. Gray, has been the only species recorded from Fiji. This last is widely spread in the Fiji Islands, having been recorded from Viti Levu, Vanua Levu, Ovalau, Kandavu, Lakemba, Ngau and Moturiki. It is a timber tree 40–50 feet high and has scarlet flowers.

The species here figured was collected by Sir Everard im Thurn while Governor of Fiji, and was described, along with other novelties found by him, in the Journ. Linn. Soc. vol. xliii. p. 19. The native name is given as 'common vunga' and the collector states that it is this tree on which the little crimson parakeets are fond of feeding.—W. B. Turrill.

Fig. 1, portion of a leaf; 2, an open flower; 3, sepals and gynoecium; 4, anthers and portions of filaments; 5, longitudinal section of ovary; 6, ovary, in transverse section, and disk. *All enlarged.*



Tabula 3054.

TIMONIUS VACCINIOIDES, *Wernham*.

Rubiaceae. Tribus Guettardeae.

T. vaccinioides, *Wernham in Trans. Linn. Soc. Bot.* ser. 2, vol. ix. ined. ; species nova, foliis rotundatis parvis crassis distincta.

Frutex ramulis rufo-pubescentibus. *Folia* late ovata vel suborbicularia, 7–11 mm. longa, 5–10 mm. lata, coriacea, glaberrima, marginibus revolutis, nervis nisi centrali omnino occlusis ; stipulae lanceolatae, acuminatae, acutae, 4 mm. latae, glabrae, deciduae. *Flores* minimi, ♂ vix 7 mm. longi, ♀ aliquanto longiores, extra sparse strigillosi. *Calycis tubus* brevis ; lobi 4, deltoidei. *Corollae tubus* subcylindricus ; lobi lati, obtusissimi, vix 1 mm. longi. *Ovarium* 9 10-loculare.—H. N. Ridley.

New Guinea : Mt. Carstensz, *C. B. Kloss.*

Fig. 1, part of inflorescence ; 2, flower ; 3, section of calyx and pistil ; 4, corolla laid open. *All enlarged*

Tabula 3055.

VITTADINIA DISTICHA, *S. Moore.*

Compositae. Tribus Asteroideae.

V. disticha, *S. Moore in Trans. Linn. Soc. Bot.* ser. 2, vol. ix. ined.; species nova, foliis angustis confertis distichis sericeis distinctissima.

Planta humilis, saepe 6 cm., rarius ad 10 cm. alta, caule lignoso, ramos complures dense foliosos emittente. *Folia* sessilia, bifariatim arcte imbricata, lineari-teretia, obtusa, 8–10 mm. longa, 1 mm. lata, marginibus maxime involutis, argyracea, deinde fusca. *Capitula* mediocria ramos terminantia, breviter pedunculata, 21-flora, pedunculo primum 3 mm. demum 10 mm. longo. *Involucrum* hemisphaericum, phyllis 3–4-seriatis lineari-lanceolatis obtusis vel subacutis 3·5–5 mm. longis extra argyraceis. *Flores radii* 15; ligulae abbreviatae, e pappo haud vel vix eminentes, lineares vel lineari-oblongae, apice integrae. *Flores disci* fertiles; corolla 5-fida, inferne anguste cylindrica, superne campanulata, 4·5 mm. longa; antherae inclusae; stylus inclusus, ramis exsertis, appendicibus subulatis. *Achaenia* compressa, oblongo-turbinata, dense sericea. *Pappi setae* 2-seriatae, paucae, scabridae, fulvae, 5 mm. longae.—H. N. Ridley.

New Guinea: Mt. Carstensz, 3150–3750 m., *C. B. Kloss.*

Fig. 1, leaf; 2, bracts; 3, ray-flower; 4, disk-flower; 5, pappus; 6, anthers; 7, style-arms. *All enlarged.*

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Tabula 3056.

PULICARIA BURCHARDII, *Hutchinson.*

Compositae. Tribus Inuloideae.

P. Burchardii, *Hutchinson*; species nova habitu *Inulae sericeae*, Benth. et Hook. f., affinis, sed foliis plerumque brevioribus, capitulis solitariis nec corymbosis, bracteis involucri acutissimis, pappo duplici facile distinguenda.

Frutex. *Rami* patuli vel decumbentes, teretes, circiter 2·5 mm. crassi, pilis albis dense cano-tomentosi; ramuli floriferi foliati, breves vel usque ad 10 cm. longi. *Folia* alterna, sessilia, linearia vel subspatulato-linearia, apice rotundata, 0·8–1·5 cm. longa, 2–2·5 mm. lata, rigide et crasse coriacea, cano-tomentosa. *Capitula* terminalia, solitaria, multiflora, fere 3 cm. expansa, brevissime pedunculata. *Involucrum* late turbinatum, circiter 8 mm. altum; bracteae circiter 5-seriatae, ab extremo sensim longiores, plerumque subulatae, exteriores cano-tomentosae, interiores glabrescentes, acutissimae. *Receptaculum* profunde alveolatum. *Flores radii* usque ad 20, patuli; corollae tubus 1·25 mm. longus, glaber; limbus oblongus, apice breviter et obtuse tridentatus, 5–6 mm. longus, trinervius; styli rami exserti. *Flores disci* numerosi; corollae tubus apicem versus sensim ampliatus, glaber; lobi ovato-lanceolati, subacuti; antherae breviter exsertae, basi longe caudatae. *Achaenia* turgida, breviter et parce pubescentia, apice contracta. *Pappus* duplex; exterior in cupulam brevem lacerato-dentatam concretus; interior setosus, setis paucis apicem versus paullum incrassatis breviter barbellatis.

Canary Islands: Fuerteventura; near Handia, *Burchard.*

The Flora of most of the Canary Islands has been comparatively well-explored; but that of the two low eastern islands nearest the African continent, Fuerteventura and Lanzaroté, is not so well known as that of the others, chiefly on account of their geographical position and unattractiveness, consequent on lower altitude and more arid climate. It is not surprising, therefore, that an occasional new species is found in these islands, and still more might be brought to light by a thorough investigation during a whole season.

Dr. Burchard discovered the novelty here described near Handia, in the island of Fuerteventura, where only a solitary bush was found. Its inclusion in the genus *Pulicaria* is determined by the structure of the pappus, which is double, consisting of an outer short lacerate-dentate cup, and an inner series of ordinary free bristles. But the true affinity of our plant, disregarding the pappus, is most clearly with *Inula sericea*, an endemic Canarian species; it is very difficult to distinguish the two when out of flower. This *Inula* is, in regard to the pappus, almost intermediate between that genus and *Pulicaria*. The setae are in a single series as in all other species of *Inula*, but they are inserted on the inner side of a cartilaginous annulus; if this annulus were toothed, *I. sericea* would be placed in *Pulicaria*, which has always a double pappus as in the plant here figured.—J. HUTCHINSON.

FIG. 1, leaf; 2, portion of receptacle; 3, ray-flower; 4, disk-flower; 5, inner pappus-seta from the same; 6, stamen; 7, style-arms; 8, achene and pappus; 9, achene with inner pappus removed. *All enlarged.*

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Tabula 3057.

PAPPOBOLUS MACRANTHUS, *Blake.*

Compositae. Tribus Helianthoideae.

Pappobolus, *Blake.* Genus *Verbesininarum* novum *Steiractiniae*, Blake, affine, sed foliis sparsis, squamis involucri 4-seriati subaequalibus herbaceis lineari-lanceolatis longissime attenuatis, ramis styli exappendiculatis, achaeniis disci exalatis glabris, apice haud patelliformibus differt.

Capitula heterogama, radiata, floribus radii neutris, disci hermaphroditis fertilibus. *Involucrum* late hemisphaericum, squamis 4-seriatis subaequalibus lineari-lanceolatis longissime attenuatis laxis herbaceis solummodo basi ima paullum subinduratis subuninerviis, dorso plus minusve adpresse pilosulis intus apice hispidulis. *Receptaculum* paullum convexiusculum, paleis scariosis complicatis flores disci amplectentibus. *Corollae radii* ligulatae, circiter 30, patentes, flavae, oblongae ; eae disci numerosissimae, regulares, tubulosae, flavae, tubo longiusculo glabro, faucibus oblongo-cylindraceis, limbo 5-dentato dentibus deltoideo-ovatis. *Antherae* basi sagittatae, apice appendice ovali-ovata flavida munitae. *Styli rami* lineares, complanati, obtusi, hirtelli, haud appendiculati. *Achaenia radii* inania ; ea disci e latere valde compressa, paullulum incrassata, obtuse obscure quadrangularia, glabra, nigra. *Pappus* caducissimus, ex aristis circiter 10 subulatis ciliatis inaequalibus compositus.—Frutex *canescente pilosulo-tomentosulus*, *alternifolius*, *oligocephalus*. Folia *ovata*, *serrata*, *triplinervia*. Capitula *magna*.

Species 1, austro-americana.

P. macranthus, *Blake* ; species unica.

Frutex vagans, 2–2·6 m. altus. *Caulis* subvalidus, flexuosus, striatus, dense canescente pilosulo-tomentosulus, infra inflorescentiam ut videtur simplex, circiter 6-cephalus. *Folia* alterna, ovata, longissime acuminata, basi truncato-rotundata, in petiolum abrupte cuneatim angustata, 1–1·6 dm. longa, 4–8 cm. lata, serrata (dentibus circiter 33-jugis depressis mucronatis), triplinervia, supra obscure viridia, submolliter pilosula pilis adpressis basi subtuberculatis, subtus dense canescente piloso-tomentosula ; petioli dense piloso-tomentosi, 1–3 cm. longi, infra submarginati.

Capitula 6–8 cm. lata, in pedunculis terminalibus et axillaribus, pauca (circiter 6); pedunculi pilosulo-tomentosi, 6–11 cm. longi; discus circiter 1·5 cm. altus, 2·5–3 cm. diametro. *Involucri* 2–2·2 cm. alti; squamae subaequales, laxae, longissime attenuatae, basi circiter 3 mm. latae. *Corollae radii* circiter 30, oblongae, 2·4 cm. longae, 4–6·5 mm. latae, pallide flavae, apice 3-denticulatae, in tubo et dorso hirtellae. *Corollae disci* flavae, 7·5 mm. longae (tubo 2·2 mm.), in basi faucium et dentibus pubescentes. *Paleae* oblongae, 8 mm. longae, ad apicem mucronato-acutum strigillosae. *Achaenia* oblonga, truncata, 4·5 mm. longa, 1·8 mm. lata. *Aristae pappi* circiter 10, caducissimae, 1·7–2·7 mm. longae.

South America: Bolivia; Muna, common in waste ground, 2135–2440 m., May 1863, *Pearce*, 121.

The genus *Pappobolus*, judging from its pappus characters, belongs to the group of *Verbesininae* containing the closely related genera *Perymenium* Schrad., *Melanthera* Rohr, and *Steiractinia* Blake, but it differs widely from all these and approaches *Helianthus* in its strongly compressed achene and herbaceous involucre. The unique specimen in the Kew Herbarium is described by the collector as an evergreen shrub six to eight feet in height. The pappus-awns are so extremely caducous as to render their exact enumeration very difficult.—S. F. Blake.

Fig. 1, outer bracts; 2, inner bract; 3, ray flower; 4, base of same; 5, pappus-awn; 6, scale of receptacle; 7, disk-flower; 8, pappus-awns; 9, disk corolla; 10, stamens; 11, style-arms; 12, achene. *All enlarged.*

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Tabula 3058.

SCHIZOPTERA PEDUNCULARIS, *Blake*.

Compositae. Tribus Helianthoideae.

S. peduncularis, *Blake*; comb. nov.

Herba perennis (?), tenuis, erecta, simplex vel laxe ramosa, 1·8–4 dm. alta et ultra. *Caulis* teres, striatus, laxe pilosus et pilosulus, basibus pilorum patentium ampliatis haud tuberculatis plus minusve persistentibus. *Folia* internodia aequantia vel multiplo breviora, ovata, breviter acuminata, basi rotundato-cuneata, 5–9·5 cm. longa, 2·3–5 cm. lata (ea ramorum minora), tenuia, trinervia, obscurissime serrulata vel crenato-serrulata, supra subsparse pilosa, aetate basibus tuberculatis persistentibus pilorum patentium lepidota, subtus vix pallidiora, densius pilosula pilis subadpressis, ad venas pilosa; petioli immarginati, dense pilosi, 4–17 mm. longi. *Capitula* parva, 5–6 mm. lata, 7·5 mm. alta, in apicibus caulis ramorumque umbellato-fasciculata, in pedunculis monocephalis striatis adscendenti-pilosis 1·6–6·2 cm. longis. *Involucri* biseriati 5·5–6·5 mm. alti squamae exteriores circiter 3–4, longiores, oblongae, subacutae, herbaceae, infra paullo membranaceae et lineatae, venoso-reticulatae, margine piloso-ciliatae; interiores circiter 3–4, membranaceo-scariosae, apice appendice obtusa herbacea brevissima munitae, ovales. *Corollae radii* circiter 10, pallide flavae; tubus sparse pilosus, 1·2 mm. longus; lamina quadrato-ovalis, emarginata, in venis dorsi sparse pilosa, 2·5 mm. longa. *Corollae disci* 8–9, flavidae, apice tubi pilosulae, in dentibus intus pilosae, 3 mm. longae. *Paleae* circiter 3, exteriores squamis interioribus involucri similes, haud herbaceo-appendiculatae; interiores membranaceae, oblongae vel lineares, apice subacutae, lacerato-ciliatae, 4–5 mm. longae. *Achaenia radii* valde obcompressa, extra convexa, intus valde concava, ovalia, brunneo-nigrescentia, costata, sparse strigillosa, 4·2–4·5 mm. longa, 3 mm. lata, ala lacerato-ciliata apice in dentes desinente praedita, epapposa; ea *disci* saepius inania, linearia, albida, interdum fertilia, clavato-linearia, obcompressa, subquadrangularia, extra 3-costata, intus valde 1-costata, 3·5 mm. longa, nigrescentia, tuberculato-strigillosa, exalata, aristis 2 sursum ciliatis, 1 mm. longis, plus minusve caducis praedita.—*Synedrella peduncularis*, Benth. Pl. Hartw. p. 119 (1843).

Schizoptera trichotoma (sphalm. *Schizopsera*), Turcz. in Bull. Soc. Nat. Mosc. vol. xxiv. pars 1, p. 182 (1851). *Laciala*, Kuntze in Post et Kuntze, Lex. p. 312 (1903).

South America: Ecuador; Guayaquil, *Ruiz & Pavon*; in woods near Guayaquil, *Hartweg*, 665; Cerro of Santana, Guayaquil, *Jameson*, 579.

The identity of *Synedrella pedunculares* and *Schizoptera trichotoma*, shown by a comparison of their respective types (*Hartweg* 665 and *Jameson* 579), does not appear to have been previously noted. In all essential features the specimens are identical; the plants collected by Jameson and by Ruiz and Pavon are trichotomously branched, those of Hartweg considerably smaller and simple or subsimple, but the difference is undoubtedly one of age and is of no diagnostic significance.

The generic descriptions of Turczaninow and of Bentham and Hooker require modification in two or three points. The rays are 2-seriate, not 1-seriate; the anthers are cordate at the base, not entire or minutely 2-dentate; the style of the hermaphrodite flower is divided, not entire, at least in most florets.

The species here figured is apparently the only one truly referable to the genus. Klatt, in Ann. Naturh. Hofmus. Wien, vol. ix. p. 360 (1894), has referred to this genus a second species from Mexico, *S. lyrata*, based on *Schmitz*, 609 in the Vienna Herbarium. The type number has not been available for examination, but from the description it seems almost certain that the species is not a member of the genus *Schizoptera*.

Notwithstanding the occasionally fertile disk-flowers, *Schizoptera* is best placed among the *Melampodinae*, where its habit and lacerate achene-wings distinguish it from *Silphium*, and its strongly obcompressed epappose winged achene from the habitally similar *Baltimora*.—S. F. Blake.

Fig. 1, head; 2, inner bract; 3, ray-flower; 4, scale and bud of disk-flower; 5, scale; 6, disk-flower; 7, stamens; 8, styles; 9, ray-achene; 10, disk-achene. *All enlarged.*

M.S. del. et lith.

Tabula 3059.

A. **MISCHOPLEURA RIDLEYANA**, *Wernham.*

B. **M. OVALIFOLIA**, *Wernham.*

Ericaceae. Tribus Rhodoreae ?

Mischopleura, *Wernham in Trans. Linn. Soc. Bot.* ser. 2, vol. ix. ined. Genus novum, verisimiliter ad tribum *Rhodorearum* referendum, anomalum (an *Ledothamno* proximum ?), corolla polypetala, ovario bicarpellato, ovulis pendulis in quoque loculo binis, fructu baccato distinctum.

Calyx 5-partitus; segmenta lanceolata. *Petala* libera, oblonga, obtusa, truncata vel retusa. *Stamina* 10; filamenta longiuscula, plus minusve flexuosa; antherae quam ea breviores, dorso muticae, apice bilobae, pubescentes, poris apicalibus dehiscentes. *Discus* crassus, carnosus, 5-lobus. *Ovarium* subglobosum, subsulcatum, biloculare; stylus brevis, validus, subconicus, persistens; stigma truncatum. *Ovula* in quoque loculo bina, pendula. *Bacca* globosa, stylo persistente coronata.—Fruticuli *vaccinioidei*. Folia *integra, crassa, subtus discoloria, reticulatione notabili, costa pervalida in petiolum crassum brevem decurrente*. Flores *inter minimos in axillis superioribus in cymas 2–3-floras dispositi*; *pedicelli saepe tenuissimi, flexuosi*.

Species 2, novo-guineenses.

A. **M. Ridleyana**, *Wernham l.c.*

Ramuli novelli graciles, obscure rufo-sericeo-puberuli, mox lignosi. *Folia* saepius subverticillata, lineari-lanceolata, acuminatissima, 1·5 cm. longa, 3 mm. lata, apice acute barbata, supra glabra, nitentia, marginibus necnon in costa subtus irregulariter sparse sericeo-pilosa, subtusque discoloria, cano-pulverulenta. *Flores* bini vel terni; pedunculi 2–4 mm. longi; pedicelli subfilamentosi, flexuosi, 6 mm longi, subglabri. *Calyx* extra basi sparse hirtus, vix 2 mm. longus, lobis lanceolatis extra glabris, intus apicem versus barbatis. *Petala* elliptica, truncata, calycem haud excedentia, glabra.—H. N. Ridley.

New Guinea: Mt. Carstensz, *C. B. Kloss.*

B. **M. ovalifolia**, *Wernham l.c.*

Ramuli novelli minute rufo-puberuli, mox lignosi. *Folia* 3,

verticillatim conferta, elliptica vel ovata, utrinque rotundata, apice minute obtuse apiculata, 1–1·4 cm. longa, 5–8 mm. lata, supra nitentia, subtus incano-pulverulenta, necnon sparse sericeo-pilosa, reticulatione utrinque prominula. *Pedunculi* graciles, 8 mm. longi, sparse minute pilosi; pedicelli 1 cm. longi, similiter induti, saepius nutantes. *Calyx* 2–5 mm. longus, extra sparse strigillosus, fere ad basin in lacinias lanceolatas 5 intus apicem versus barbatas divisus. *Petala* oblonga, obtusa, subtruncata, glabra, calycem vix excedentia. *Bacca* 5 mm. diametro.—H. N. Ridley.

New Guinea: Mt. Carstensz, *C. B. Kloss.*

A. Mischopleura Ridleyana. Fig. 1, leaf; 2, flower; 3, petal; 4, glands and stamens; 5, section of pistil. *All enlarged.*

B. M. ovalifolia. Fig. 6, flower; 7, sepal; 8, petal; 9, stamens and pistil; 10, gland and stamens; 11, section of ovary. *All enlarged.*

J.S. delt. et lith

Tabula 3060.

NEOWOLLASTONIA TABERNAEMONTANOIDES,

Wernham.

Apocynaceae. Tribus Plumerieae.

Neowollastonia, *Wernham in Trans. Linn. Soc. Bot.* ser 2, vol. ix. ined. Genus novum *Ervatamiae*, Stapf, affine, sed ovario syncarpo, glandulis intracalycinis nullis, corollae lobis obliquissimis distinctum.

Calyx ad basin 5-partitus, eglandulosus; lobi obtusi, imbricati. *Corolla* hypocrateriformis; tubus rectus, subcylindricus, ad stamina vel supra parum dilatatus, intus in staminum regione pilosus; lobi valde obliqui, sinistrorsum obtegentes. *Stamina* infra tubum medium inserta; antherae sagittatae, acutissimae, basi bilobae, nec appendiculatae. *Discus* obsoletus. *Ovarium* integerrimum, biloculare, in stylum brevem angustatum; stigma fusiforme. *Ovula* in loculis numerosa.—Folia *opposita penninervia*.

Species 1, novo-guineensis.

N. tabernaemontanoides, *Wernham l.c.*; species unica.

Frutex praeter inflorescentiam glaber, ramulis striatis complanatis. ***Folia*** firme chartacea, oblonga, breviuscule obtuse acuminata; petioli supra alte canaliculati, nervis secundariis prominulis utrinsecus 15, tenuioribus interjectis. *Inflorescentia* terminalis, a basi 2–3-brachiata, primo densiuscula, tardius laxior, ramis costato-striatis angulatis minutissime pulverulentis. *Sepala* ovata, rotundata, sparse minute ciliata. *Corollae* tubus superne parum ampliatus, extra minute griseo-pubescens, intus infra staminum insertionem in zona 1·5 mm. alta pilis deflexis instructus, lobis oblique quadratis tortis acuminatis. *Stamina* supra tubi basin inserta; filamenta brevia, lata, complanata, basi pilosa. *Ovarium* glabrum.—H. N. Ridley.

New Guinea: Mt. Carstensz, *C. B. Kloss.*

Fig. 1, bud; 2, section of calyx and pistil; 3, corolla laid open; 4, anthers; 5, style and stigma; 6, section of ovary. *All enlarged.*

M.S delt et lith

Tabula 3061.

DALZIELIA OBLANCEOLATA, *Turrill.*

Asclepiadaceae. Tribus Marsdenieae.

Dalzielia, *Turrill.* Genus novum, *Oncostemmae*, K. Schum., affine, sed lobis coronae exterioris lobis corollae oppositis, corona interiore gynostegio adnata haud annulari, lobis antheris oppositis et aequalibus, polliniis erectis cylindricis haud subglobosis.

Calyx fere ad basin lobatus, lobis mediocribus. *Corolla* campanulato-lobata, lobis quinque patentibus. *Corona* duplex; exterioris lobi petalis oppositi, subrotundati; interioris lobi staminibus oppositi, gynostegii apicem versus inserti, apice in rostra conniventia attenuati. *Pollinia* erecta, cylindrico-ellipsoidea. *Styli* apex conicus.—Frutex (*volubilis* ?). Inflorescentiae *stricte umbellatae, axillares.*

Species 1, africana.

D. oblanceolata, *Turrill*; species unica.

Frutex volubilis (?), caulibus superne puberulis. *Folia* oblanceolata, apice obtuse acuminata, basi in petiolum gradatim angustata, usque ad 12 cm. longa et 1·8 cm. lata, fere glabra, pagina superiore costa nervisque leviter impressis, pagina inferiore nervis prominentibus, lateralibus utrinsecus circiter 12; petiolus 5 mm. longus, puberulus. *Umbellae* axillares, usque ad 15-florae; pedunculus 1·5 cm. longus, puberulus; pedicelli 1·2–1·5 cm. longi, glabri; bracteae lineares, acutae, 2 mm. longae. *Sepala* lanceolata, acuta, 5 mm. longa, 1·75 mm. lata, ciliata. *Corolla* campanulato-rotata, tubo vix 2 mm. longo basi 2 mm. diametro, lobis orbiculari-ovatis acutis vel subacutis 5 mm. longis 4 mm. latis ciliatis; coronae exterioris lobi petalis oppositi, subrotundati, 0·75 mm. longi, 2·5 mm. lati, ciliati, dense puberuli. *Coronae interioris* lobi staminibus oppositi, gynostegii apicem versus inserti, glabri, dorso inflati, apice in rostra conniventia attenuati, antheris aequilongi. *Antherarum* appendiculae conniventes, oblongae, apice rotundatae, glabrae; pollinia cylindrico-ellipsoidea, basin versus angustata, 0·6 mm. longa; corpuscula obtuse sagittata, 0·4 mm. longa, apice rotundata. *Ovaria* distincta, cylindrica, glabra; styli apex conicus.

West Tropical Africa: Sierra Leone; Charlotte Falls, Freetown,

a shrub growing by rocky streams, *J. M. Dalziel*, 1000; Makump, 120 m., *N. W. Thomas*, 933.

The genus *Oncostemma* was described and figured by Schumann in Engl. Jahrb. vol. xvii. p. 148, t. vi. fig. R–T. Although the description of that genus does not agree with Schumann's figures, it seems to be the one nearest to that described here, which, on account of the erect opaque pollinia without pellucid margins, also finds a place in the tribe *Marsdenieae*.

Judging from Schumann's description and figures, there seems a complete agreement between the two genera in the position of the outer corona at the base of the corolla lobes and opposite to them. The nature of this outer corona ("corollinische corona" of Schumann in Engler's Pflanzenfamilien, vol. iv. 2, p. 200) in *Dalzielia* favours the view that its lobes represent emergences from the inner surface of the corolla and are of a different morphological nature from the lobes of the inner corona, which arise from the staminal column (gynostegium) and are opposite to and appendages of the stamens.

The pollinia in *Dalzielia* are cylindric-ellipsoid and not subglobose like those of *Oncostemma*. The shape of the pollen-carrier (corpusculum) is different in the two genera; in our genus it is obtusely sagittate, projects between the two erect pollinia, and is equal to two-thirds their length. According to Thomas, *D. oblanceolata* is known in Sierra Leone as *Nyinawe*.—W. B. Turrill.

Fig. 1, flower; 2, side view of flower; 3, flower laid open; 4, portion of staminal column; 5, pollinia; 6, gynoecium. *All enlarged.*

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M S. delt et lith

Tabula 3062.

SOLANUM PERANOMALUM, *Wernham.*

Solanaceae.

S. peranomalum, *Wernham in Trans. Linn. Soc. Bot.* ser. 2, vol. ix. ined.; species nova, affinis *S. Kaernbachii*, Laut. et K. Schum., a qua glabritie facile distinguitur.

Frutex ramis florentibus teretibus validiusculis, novellis complanatis glabris. *Folia* per paria approximata, valde inaequalia; folia majora oblonga, breviter acuminata, acuta, basi saepe obliqua, 11–13 cm. longa, 4·5–5·3 cm. lata, integerrima, chartacea, glabra, nervis subtus prominentibus, secundariis utrinsecus 8–9; petioli 1 cm. longi, lignosi; folia minora suborbicularia, basi cordata, subsessilia. *Flores* numerosi, e pulvillo basi foliorum sito orti. *Pedicelli* tenues, 8 mm. longi, ut calyces sparse rufo-hirtelli. *Calyx* cupularis, 2·5 mm. longus, integerrimus. *Corolla* vix 4 mm. longa, fere ad basin in lacinias oblongo-lanceolatas divisa, minute hirtella.

New Guinea: Mt. Carstensz, 45 m., *C. B. Kloss.*

The very woody habit of this plant, with its sessile inflorescences and blunt ellipsoidal buds, causes it to bear little resemblance to a typical *Solanum*; its appearance rather recalls *Brachistus*.—H. N. Ridley.

Fig. 1, bud; 2, section of flower; 3, portion of corolla from inside; 4, pistil; 5, vertical section of ovary; 6, transverse section of ovary. *All enlarged.*

M S del^t et lith.

Tabula 3063.

POLYPOMPHOLYX MULTIFIDA, *F. Muell.*

LENTIBULARIACEAE.

P. multifida, *F. Muell. Fragm.* vol. vi. p. 162; affinis *P. tenellae*, Lehm., sed scapo et floribus majoribus, calcare quam labio inferiore dimidio breviore facile distinguenda.

Herba terrestris, gracilis, erecta, saepissime 10–16 cm. (interdum usque ad 36 cm.) alta, rhizoideis numerosis 0·5–2 cm. longis. *Folia* omnia radicalia, spatulata vel lineari-spatulata, sensim in petiolum attenuata, eo incluso 3–11 mm. longa, 2 mm. lata, supra glabra. *Utriculi* in rhizoideis terminales, reversi, ellipsoidei, 2 mm. longi, ad ostium vix contracti, dorso latiuscule carinati, in utroque latere e medio sursum ala obliqua ovata parce ciliata munita, labio antico subquadrato bicorni, orificio angusto in utroque latere pilis deflexis barbatulo. *Scapus* gracilis, saepissime 2–3-florus, rare 1-florus vel in plantis robustis 5–6-florus; bracteae et bracteolae minutae, acutae. *Calycis* segmenta 4, inter se inaequalia, lateralia 2 mm. longa, rotundata, anticum et posticum 3 mm. longa, 2·5 mm. lata. *Corolla* purpureo-lilacina vel punicea; labium superius fere ad basin bifidum, lobis acutissimis 2–5 mm. longis; labium inferius late alte trilobatum lobis bilobis vel intermedio trilobo, 1 cm. longum, 1·4 cm. latum; palatum flavum, glabrum, fauce tuberculis aurantiacis instructum; calcar obtusum, 3 mm. longum. *Staminum* filamenta membranacea planaque; antherae 1 mm. longae. *Stylus* brevissimus; stigma bilabiatum labio supero majore. *Capsula* globosa, 4–5 mm. longa, membranacea. *Semina* plurima.—*Utricularia multifida*, R. Br. Prod. p. 432; A. DC. Prod. vol. viii. p. 18; Benth. in Hueg. Enum. p. 82. *U. latiloba*, Benth. l.c. *Polypompholyx Endlicheri*, Lehm. Nov. Stirp. Pug. viii. p. 48; Pl. Preiss. vol. i. p. 340. *P. latiloba*, Lehm. l.c. 49, l.c. 341. *Tetralobus Preissii*, A. DC. Prod. vol. viii. p. 667.—E. M. COTTON.

WESTERN AUSTRALIA: Swan River, *Drummond*, 507, 509; *E. Pritzel*, 770; Guildford, near Perth, in swamps, Sept. and Oct. 1901, *Cecil Andrews*, 1st coll. 672; King George's Sound, Jan.–Feb. 1854, *W. H. Harvey*; *Hooker*, 1835; *B. Brown*, 2726; *McLean*; Albany, *B. T. Goadby*, 22; towards Porongnup (Porongurup?) *Mueller*; Westbourne, Dwalganup, *Carter*, 113.

FIG. 1, leaf; 2 and 3, flowers; 4, stamens; 5, pistil; 6 and 7, utricles. *All enlarged.*

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Tabula 3064.

THESIDIUM EXOCARPAEOIDES, *Sond.*

Santalaceae.

T. exocarpaeoides, *Sond. in Flora*, 1857, p. 365; *A. W. Hill in Dyer, Fl. Cap.* vol. v. sect. 2, p. 202; species *T. Thunbergii*, Sond., affinis, ramis tenuissimis bracteis minutis fructibus subsessilibus praecipue differt.

Herba caudice robusto lignoso. *Caules* erecti, subtus lignosi, praecipue in plantis foemineis, glabri, virides, teretes, sulcati, 25–37 cm. alti, ramis et ramulis elongatis tenuibus flexuosis imprimis in plantis masculis conspicue sulcatis et versus apicem subangulatis, costis corneis translucentibus. *Folia* minuta, squamiformia, subrotunda. *Flores* solitarii, pauci, in spicas flexuosas elongatas regulariter instructi, bracteis bracteolisque late subrotundis carnosis carinatis circiter 0·5 mm. longis quam flores multo brevioribus marginibus membranaceis fimbriatis. *Floris masculi perianthium* circiter 0·75 mm. longum, tubo minuto hypocrateriformi, segmentis ovatis repandis 0·5 mm. longis; antherae exsertae. *Floris foeminei perianthium* 0·75 mm. longum, segmentis lanceolatis subacutis marginibus inflexis subrepandis; stylus 0·35 mm. longus. *Fructus* subsessilis, globosus, 1–1·5 mm. longus, reticulationibus conspicuis instructus.—*T. microcarpum*, A. DC. in DC. Prodr. vol. xiv. p. 674. *Thesium microcarpum*, A. DC. Esp. Nouv. Thes. p. 5; Sond. in Flora, 1857, p. 405.

South Africa: Cape Colony; Swellendam Division, Hessaquas Kloof, *Zeyher*, 3814; Riversdale Division, hills near the Gouritz river, 60 m., *Schlechter*, 5717; Albany Division, Bothas Berg, near Grahamstown, 670 m., *MacOwan*, 1188.

The genus *Thesidium*, containing seven species from South Africa only, can be divided into two groups. In one of these the male and female plants are very similar in vegetative characters; in the other they are so unlike that unless collected together the male and female plants would not be recognised as belonging to the same species. *T. exocarpaeoides* is the most slender of the three species in which male and female plants are alike. It was formerly placed in *Thesium* by De Candolle.—A. W. Hill.

Fig. 1, a portion of the male inflorescence with bracts, bracteoles, and flowers; 2, a male flower showing the four spreading perianth segments and the anthers; 3, a male flower dissected; 4, a perianth segment showing the anther and its attachment-hairs; 5, a portion of an inflorescence of a female plant; 6, a female flower expanded to show the style; 7, a female flower dissected, the ovary somewhat swollen; 8, a fruit showing ribs and reticulations and persistent perianth segments. *All enlarged.*

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Tabula 3065.

THESIDIUM FRUTICULOSUM, *A. W. Hill.*

Santalaceae.

T. fruticulosum, *A. W. Hill in Kew Bull.* 1915, p. 99, *et in Dyer, Fl. Cap.* vol. v. sect. 2, p. 205; species suffruticosa, robusta, ramulorum costis et bracteis verruculosis vel subscabridulis bracteis floribus paullo longioribus, floribus binis in bractearum cornearum axillis in plantis feminis distincta.

Suffrutex circiter 30 cm. altus; caules erecti vel patuli, in plantis masculis valde ramosi, robusti, lignosi, acute costati vel subangulati, costis verruculosis vel subscabridulis. *Plantae masculae*: rami numerosi, recti, patuli, costis prominenter verruculosis vel subscabridis, omnino et plus minusve dense floriferi; bracteae foliosae, lanceolatae, acutae, circiter 3 mm. longae, acute carinatae, supra planae, verruculosae vel subscabridulae, carina et marginibus translucentibus; bracteolae 2·5 mm. longae, floribus longiores; flores in cymulas 3-floras axillares subsessiles; perianthium 1·25 mm. longum; segmenta triangulari-ovata, 0·75 mm. longa; antherae circiter 0·15 mm. longae. *Plantae foemineae*: rami robusti, erecti, inflorescentiis axillaribus confertis ornati, angulati, angulis prominentibus corneis verruculosis; bracteae lanceolatae, 4–6 mm. longae, carinatae, carinis acute alatis in caule decurrentibus corneis et scabridis, marginibus plicatis scabridis; bracteolae bracteis similes, floribus longiores; flores in cymulas 2-floras dispositi, axillares, sessiles; perianthium circiter 0·75 mm. longum; segmenta erecta, 0·5 mm. longa; stylus robustus, 0·25 mm. longus. *Fructus* subsessilis, globosus, 1·5 mm. diametro, conspicue reticulatus.

South Africa: Cape Colony; Cape Division, Table Mountain, on Groene Kloof, *Galpin*, 4556; Slang Kop, 220 m., *Wolley Dod*, 3187; slopes near Buffels Bay, *Wolley Dod*, 2869; Durban Hills, *Guthrie*, 2407; Caledon Division, near Vogelgat, 320 m., *Schlechter*, 10,414 (?); without definite locality, *Harvey*, 709 ♂ and ♀.

This *Thesidium* belongs to the group of species in which the male and female plants are very dissimilar. In the female plant the branches are stout, and the verruculose and horny ribs and angles are very conspicuous. The flowers are arranged in small cymes.—A. W. Hill.

Fig. 1, male plant, an axillary inflorescence showing the axis with horny verruculose angles, bracts, bracteoles, and group of male flowers; 2, a single male flower with spreading perianth segments and anthers; 3, a perianth segment and its anthers with attachment-hairs; 4, female plant, portion of an inflorescence showing the bracts and bracteoles with prominent horny verruculose keels and margins and cyme of flowers; 5, a female flower with spreading perianth segments and stout style; 6, a female flower after fertilization; 7, a fruit with its ribs and reticulations. *All enlarged.*

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Tabula 3066.

PTEROGLOSSASPIS EUSTACHYA, *Reichb. f.*

Orchidaceae. Tribus Vandeae.

P. eustachya, *Reichb. f. Otia Bot. Hamb.*, p. 67; *Rolfe in Dyer Fl. Trop. Afr.* vol. vii. p. 99; a *P. Engleriano*, Kraenzl., labello obtuso, disco 5–7-nervi differt.

Herba terrestris. *Rhizoma* incrassatum, rugosum, vaginis membranaceis vestitum. *Folia* 2 vel 3, longe petiolata, erecta, elongato-linearia, subacuta, plicato-venosa, 45–60 cm. longa, 1–1·5 cm. lata, basi angusta, vaginis tubulosis imbricatis obtecta. *Scapi* erecti, circiter 75 cm. longi, vaginis lanceolatis numerosis imbricatis vestiti; racemi oblongi, circiter 5 cm. longi, multiflori. *Bracteae* lanceolatae vel lineari-lanceolatae, acuminatae, 1·3–2 cm. longae. *Pedicelli* 6–8 mm. longi. *Flores* mediocres. *Sepala* et *petala* patentia, elliptico-oblonga, subobtusa, undulata, circiter 1·2 cm. longa. *Labellum* patens, trilobum, ecalcaratum; lobi laterales divergentes, oblique elliptici, obtusi, 5–6 mm. longi; lobus intermedius ovato-ellipticus, obtusus, 8–9 mm. longus; discus incrassatus, tuberculorum seriebus 5–7 instructus. *Columna* lata, 4 mm. longa, apoda. *Anthera* 1-locularis; pollinia 2, subglobosa, anthera dehiscente stipiti brevi affixa; glandula squamiformis.

East Tropical Africa: Tigre or Begemder, *Schimper*, 1235.

The original species of a small genus of terrestrial Orchids nearly allied to *Eulophia*, but differing in the absence of a spur and other details of the flower. It was collected in Abyssinia by Schimper. Since then three other Tropical African species have been described, together with a fifth species, from Argentina, *P. argentina*, Rolfe, for although so widely separated geographically no structural difference can be found. More recently a sixth species, *P. ecristata*, Rolfe, a native of Florida, has been added, this being a plant that has occupied a transitory position in no fewer than four different genera, but which agrees with the others named both in habit and structure. The genus has thus a somewhat anomalous distribution.—R. A. Rolfe.

Fig. 1, flower, with sepals and petals removed; 2, column; 3, anther case; 4, pollinia, with stipes and gland. *All enlarged.*

Tabula 3067.

ERIOLOPHA FLAGELLARIS, *Ridl.*

Zingiberaceae. Tribus Zingibereae.

Eriolopha, *Ridley in Trans. Linn. Soc. Bot.* ser. 2, vol. ix. ined. Genus novum ex affinitate *Alpiniae*, antherae crista ampla lata crassa pilosa insigne, etiam (an semper ?) spicarum evolutione distinctissimum.

Calyx tubulosus, lobis oblongis cucullatis ; labellum brevius, coriaceum vel carnosum, integrum, saepe hirtum. *Stamina* brevia ; filamentum inclusum ; anthera oblonga, connectivi appendice magno oblongo crasso utrinque hirsuto. *Stylus* crassiusculus, stigmate majore clavato hirto.—Herbae *foliis lanceolatis sessilibus*. Inflorescentia *paniculata, terminalis, spicis singulis dissitis vel in capitulis congestis pauciflоris vel multifloris saepe gradatim elongatis, bracteis coriaceis ovatis vel oblongis truncatis floribus parvis pedicellatis.*

Species circiter 16, papuanae.

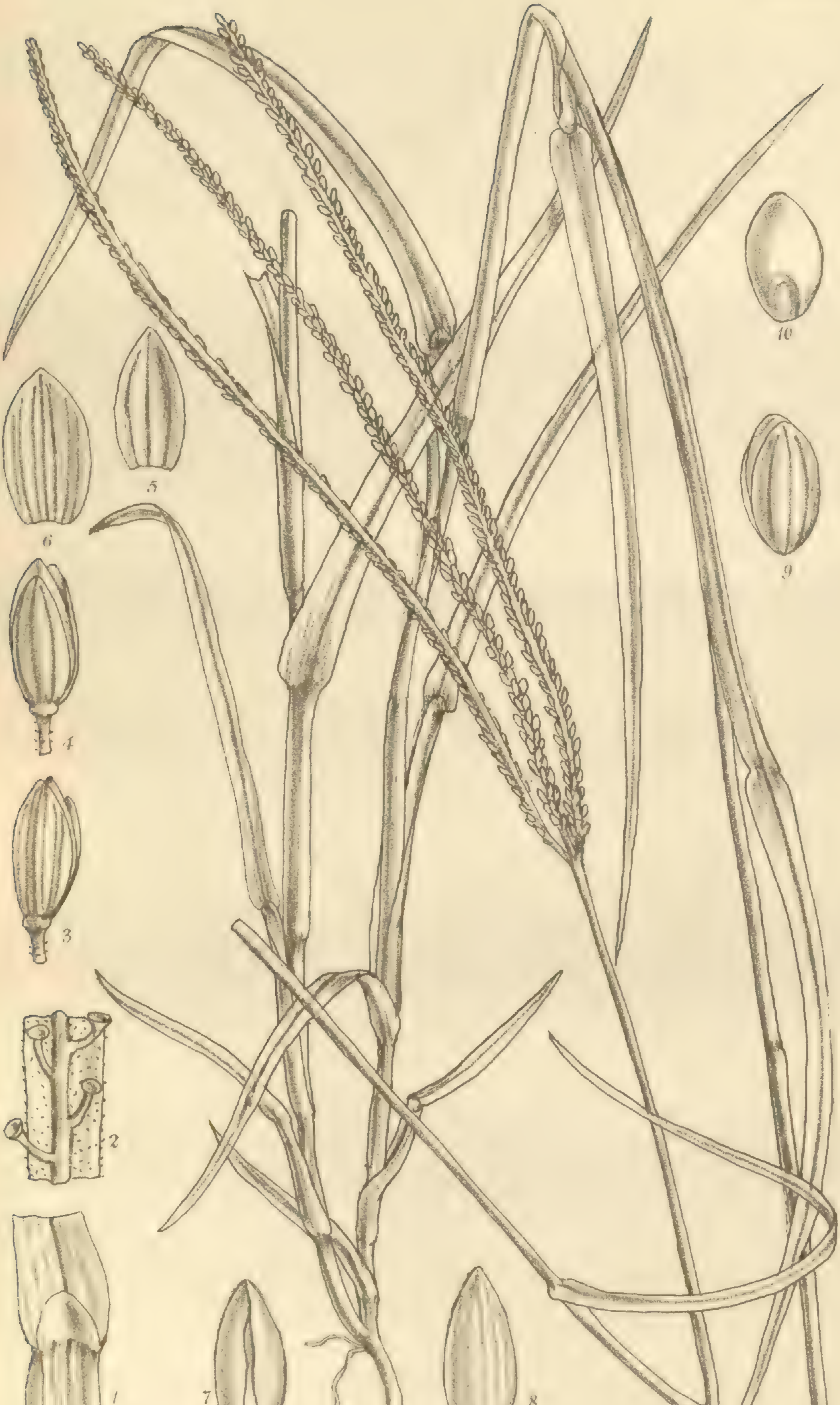
E. flagellaris, *Ridley l.c.* *Caulis* subgracilis, *Folia* ovato-lanceolata, basi rotundata, 18 cm. longa, 6 cm. lata, coriacea, glabra ; ligula rotundata, integra. *Inflorescentia* 70 cm. longa, rhachi elongata gracili angulata pubescente, internodiis 9 cm. longis 1·5 mm. crassis ; spicae plures, cylindricae, 10–11 cm. longae ; bracteae basi angustatae, lineares, acuminatae, 11 cm. longae, 7 mm. latae, papyraceae ; florales ovatae, 5 mm. latae, imbricatae, carinatae, sericeae ; pedicellus sericeus. *Calyx* tubulosus, 1·5 cm. longus, sericeus, lobis lanceolatis acuminatis. *Corollae* tubus pubescens, lobis lanceolatis acuminatis ; labellum oblongum, obtusum, apice rotundato-undulatum, 1 mm. longum. *Anthera* linearis, dorso pubescens, appendice oblongo truncato integro hirto. *Ovarium* obovatum ; stylus aequilongus, stigma hirtum, obcuneatum. *Capsula* globosa, 5 mm. diametro, laevis.

New Guinea : Mt. Carstensz, 1170–1650 m., *C. B. Kloss.*

The genus *Alpinia* as described by Schumann in the ' Pflanzenreich ' contains a heterogeneous collection of about 140 species arranged in six sections ; several of these sections appear to be sufficiently distinct to be treated as genera. One of these groups is the genus *Eriolopha*, which includes about 16 species. It is peculiar to New Guinea and

a few adjacent islands, and is characterised by the large, broad and thick anther crest, which is also very hairy. In most of the species, if not in all, the development of the flower spike is very peculiar. The inflorescence, having developed to its full length or nearly so, produces spikes containing one or two flowers enclosed in long, stiff bracts. These spikes then elongate, as more and more flowers are produced, into a long cylindric spike covered with short, hard, imbricating bracts. I know of nothing like this form of development in any of the *Zingiberaceae*.—H. N. Ridley.

Fig. 1, flower, petals removed ; 2, anther and stigma ; 3, staminodes ; 4, stigma ; 5, section of ovary ; 6, fruit. *All enlarged.*



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Tabula 3068.

DIGITARIA EXILIS, *Stapf*.

Gramineae. Tribus Paniceae.

D. exilis, *Stapf in Kew Bull.* 1915, p. 385; affinis *D. longiflorae*, Pers., spiculis glaberrimis turgidulis distincta.

Gramen annuum, ultra 0·5 m. altum. *Culmi* glabri, erecti vel geniculato-adscendentes, simplices vel basi parce ramosi, 5–8-nodi, internodiis praeter summum longe exsertum plerumque pro maxima parte vaginis inclusis. *Foliorum* vaginae arctae, nisi inferiores laxiusculae, striatae, glabrae, laeves, inferiores magis minusve carinatae; ligulae membranaceae, rotundatae, ad 2 mm. longae; laminae lineares, superne sensim attenuatae, acutae, 0·5–1·5 cm. longae, 3–7 mm. latae, planae, glabrae, costa tenui, nervis lateralibus primariis utrinque 3–4. *Racemi* 2–4, digitati, sessiles vel subsessiles, 5–12 (raro ad 14) cm. longi, graciles, pallide virides, rhachi applanata 0·5–1 mm. lata viridi ad margines scabrida, costa crassiuscula albida dorso subconvexa laevi facie distincte convexa interdum parce minute puberula; pedicelli geminati vel superne solitarii, basin versus 3–4-nati, flexuosi, teretes, apice discoideo-dilatati, 0·5–1 mm. longi, albidi, laeves vel interdum parce minute puberuli. *Spiculae* subimbricatae, elliptico-oblongae, acutae, 1·75–2 mm. longae, pallide virides, glaberrimae, facie abaxiali applanatae. *Glumae* valde inaequales; inferior hyalina, enervis, minuta vel minutissima, superior late oblonga, obtusa vel subobtusa, inter nervos 3–5 virides percurrentes hyalina, spicula paullo brevior. *Valva* anthoecii inferioris sterilis elliptica, subobtusa, spiculam aequans, tenuis, inter nervos 7 prominulos virides hyalina, nervis parallelis fere aequidistantibus sub apice venis transversis connectis, cum valvula minutissima quadrata papillosa; valva anthoecii superioris fertilis tenuiter papyracea, acuta, spiculam aequans, tenuiter 5-nervis, nitidula, valvulam similem fere omnino amplectens. *Stamina* 3. *Stigmata* atropurpurea, breviter sub spiculae apice exserta. *Caryopsis* oblongo-ellipsoidea, 1 mm. longa, albida, laevis, nitidula, arcte valva valvulaque paullo induratis fuscis inclusa; scutellum ovato-ellipticum, vix mediam caryopsin attingens.—*Digitaria longiflora*, Chevalier, Mission au Sénégal, p. 241, non Retz. *Paspalum exile*, Kippist in Proc. Linn. Soc. vol. i. pp. 157, 167.

West Tropical Africa: Sierra Leone; without precise locality, *Afzelius*, *R. Clarke*, *Schön*. French Guinea; San, *Chevalier*, 2217; Kourousou, *Pobéguin*, 490. Togoland, Difalu, *Kersting*. Nigeria; Nassarawa, *Elliot*, 195; Zaria, *Lamb*, 53; Niger Province, *Yates*, 29.

An account of the economic uses and value of this grass has been published in the Kew Bulletin for 1915, pp. 383–386.—O. Stapf.

Fig. 1, ligule; 2, part of a raceme with the spikelets removed; 3, spikelet, abaxial face; 4, the same, adaxial face; 5, upper glume; 6, valve of lower (barren) floret; 7, upper floret, face view with palea of lower floret in front; 8, the same seen from behind; 9, fruiting spikelet; 10, grain. *All enlarged.*

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Tabula 3069.

DIGITARIA IBURUA, *Stapf*

Gramineae. Tribus Paniceae.

D. Iburua, *Stapf in Kew Bull.* 1915, p. 382, figs. 1–10; affinis *D. ternatae,* Stapf, sed spiculis majoribus glaberrimis densissime imbricatis distincta.

Gramen annuum, ultra 0·5 m. altum. *Culmi* glabri, erecti, simplices, 4–5-nodi, internodiis praeter summa vaginis inclusis. *Foliorum* vaginae arctae, striatae, glabrae, laeves, inferiores superne carinatae; ligulae membranaceae, rotundatae, 2–3 mm. longae; laminae lineares, basi latiusculae, superne longe tenuiter attenuatae, ad 30 cm. longae, 1 cm. latae, planae, post ligulam pilis longis sparse obsitae, costa tenui supra prominente, nervis lateralibus primariis utrinque circa 6. *Racemi* subcompositi, 4–10, digitati, infimi a caeteris arcte approximatis 1–2 cm. distantes, omnes suberecti, 12–13 cm. longi, graciles, densi, pallide virides, rhachi triquetra paulo ultra 1 mm. lata albida dorso rotundata laevi angulis viridibus anguste alatis scaberulis; ramuli tenuiter filiformes, rhachi adpressi, ad 5 mm. longi, circiter 4 mm. distantes, a basi 4–5-spiculati, angulares, scaberuli, breviter pilosuli vel glabri; pedicelli ramulis simillimi, inferiores perbreves, superiores ad 2·5 mm. longi, apice minute barbatuli, vix incrassati. *Spiculae* arcte imbricatae, elliptico-lanceolatae, acutae, 2 mm. longae, pallide virides, glaberrimae, facie abaxiali applanatae. *Glumae* hyalinae, inferior minutissima vel suppressa, superior ovata, obtusa, 0·75–1 mm. longa, tenuiter 3-nervis. *Valva* anthoecii inferioris sterilis tenuiter membranacea, spiculae aequilonga, sub-7-nervis, nervis interioribus 3 parallelis approximatis prominentibus, lateralibus ad flexuras per paria approximatis, cum valvula fere microscopica lata emarginato-truncata; valva anthoecii superioris fertilis tenuiter papyracea, inferiori aequilonga, laevis, obscure nervosa, valvulam similem marginibus late amplectens. *Stamina* 3; antherae 1 mm. longae. *Stigmata* sub apice breviter exserta. *Caryopsis* ellipsoidea, a dorso subcompressa, 1·5–1·75 mm. longa, alba, tenuissime foveolata, valva valvulaque brunnescentibus paullo induratis arcte inclusa; scutellum late ellipticum, vix ad mediam caryopsin attingens.

West Tropical Africa: Nigeria; Hausa States, sown as a field crop at Zaria, *Lamb,* 54.

An account of the economic uses and value of this grass has been published in the Kew Bulletin for 1915, pp. 381-383.—O. Stapf.

Fig. 1, ligule; 2, part of a raceme with the spikelets removed; 3, spikelet, abaxial face; 4, the same, adaxial face; 5, upper glume; 6, valve of lower (barren) floret; 7, upper floret, face view with valvule of lower floret in front; 8, the same, seen from behind; 9, fruiting spikelet; 10, grain. *All enlarged.*

M. J. Helt et lith.

Tabula 3070.

MICROCALAMUS CONVALLARIOIDES, *Stapf.*

Gramineae. Tribus Paniceae.

M. convallarioides, *Stapf*; species nova, affinis *M. barbinodi*, Franch., sed foliorum lamina praeter setulas paucas glaberrima et laxius nervosa basi longius attenuata, cellulis epidermatis paginae inferioris amplioribus, spiculis paulo latioribus longioribusque distincta.

Gramen perenne, rhizomate brevi. *Culmi* geniculato-adscendentes, inflorescentia dempta 15–20 cm. alti, 3–4-nodi, e nodis inferioribus radicantes, teretes, glaberrimi, nervoso-striati, internodiis inferioribus ob vaginas emarcescentes magis minusve nudis, caeteris breviter exsertis. *Foliorum* vaginae teretes, arctae, tenuiter et crebre nervoso-striatae, ad nodos tomentosae vel pubescentes, ad junctionem cum lamina barbatae, caeterum glabrae; ligulae vix ullae; laminae cum vagina articulatae, demum secedentes, ima basi breviter pulvinatim incrassatae, lanceolatae, acute acuminatae, basin versus longe et subasymmetrice attenuatae, 14–18 cm. longae, 3–3·5 cm. latae, papyraceae, glaberrimae, laeves, costa tenui albida, nervis lateralibus ultimi ordinis tenuibus, 0·7–0·8 mm. inter se distantibus, venis transversis crebris hic inde prominulis. *Panicula* 4–6 cm. longa, ob ramulos breves paucispiculatos paupera, rhachi gracili angulata superne minute puberula; rami filiformes, a basi 4–2 spiculas gerentes vel superiores simplices, 5–6 mm. longi; pedicelli tenues, laterales ad 1·5–2 mm. longi, scaberuli, apice vix discoideo-dilatati. *Spiculae* perfectae oblongae, subulato-acuminatae, 7·5 mm. longae, albidae. *Glumae* late ovatae, breviter apiculatae, inferior 2·5–3 mm. longa, 5-nervis, superior 3·5–4 mm. longa, 7–9-nervis. *Anthoecii inferioris ♂ valva* oblonga, breviter acute acuminata, 6·5–7 mm. longa, 7-nervis cum valvula paullo breviore. *Anthoecii superioris ♂ valva* a latere visa oblongo-lanceolata, subulato-acuminata, spiculae longitudine, sursum paullo incurva, acumine minute scaberulo, chartacea, 5-nervis, glabra, nervis obscuris, cum valvula paullo breviore. *Antherae* 4 mm. longae. *Stigmata* paullo sub apice anthoecii lateraliter exserta, pallida, 1 mm. longa.

West Tropical Africa: French Gaboon; Como River, in hill forests, *Bates*, 481.

The genus *Microcalamus*, Franch., includes, besides *M. barbinodis*, Franch., and the plant figured and described here, a third species so far found only in the Cameroons. This species, for which the name *M. aspidistrula* is proposed, is here briefly diagnosed.

M. aspidistrula, *Stapf.*

Gramen habitu generis, sed saepe quam caeterae species robustius. *Foliorum* vaginae firmae, diutius persistentes, infimae 2–3 lamina destitutae, sursum accrescentes, ad 15 cm. longae ; lamina lanceolatae, acutae, basi breviter vel longiuscule attenuatae, 10–25 cm. longae, 2–7 cm. latae, firmae, subtus tenuiter adpresse pubescentes, demum interdum glabratae, nervis ultimi ordinis 0·6–0·7 mm. distantibus. *Paniculae* angustae, 7–20 cm. longae, ramis distantibus ad 6 cm. longis breviter ramulosis. *Spiculae* oblongo-lanceolatae, saepe subobliquae, 7–8 mm. longae. *Glumae* firmae, inferior circiter 2 mm. longa, 5–7-nervis, superior 4 mm. longa, 7-nervis. *Anthoecii inferioris* ♂ (rarius neutrius) *valva* breviter acuminata, spicula paullo brevior, 7-nervis, cum valvula aequilonga vel magis minusve redacta. *Anthoecii superioris* ♂ *valva* subcoriacea, a latere visa oblongo-lanceolata, tenuiter pilosa (saltem basin versus), obtusiuscule acuminata.

West Tropical Africa : Cameroons ; Bipindi, *Zenker*, 1523, 1834, 2144, 4249, 3193; Efulen, *Bates*, 251. Gaboon ; Sierra del Crystal, *Mann*, 1646.

The habitus of these curious grasses recalls that of the dwarf herbaceous bamboos of West Africa, *e.g. Puellia*, but the structure of the spikelets is typically panicoid, and the anatomy of the leaves differs greatly from that of true bamboo leaves. *Microcalamus* approaches very nearly to *Ichnanthus*, but it lacks the peculiar appendages of the fertile valve so characteristic of that genus.—O. Stapf.

Fig. 1, ligule ; 2, spikelet ; 3, lower glume ; 4, upper glume ; 5, the two florets ; 6, valve of lower floret ; 7, valvule of the same with ♂ flower ; 8, valve of upper floret ; 9, valvule of the same ; 10, pistil and lodicules. *All enlarged.*

Tabula 3071.

POECILOSTACHYS HILDEBRANDTII, *Hack.*

Gramineae. Tribus Paniceae.

Poecilostachys, *Hack. in Sitzb. Akad. Wissensch. Wien*, vol. lxxxix. (1884), p. 131; *in Engl. & Prantl, Nat. Pflanzenf.* vol. ii. Abt. ii. p. 70; *True Grasses*, p. 158 (descr. emend.). Genus *Oplismeno*, Beauv., arcte affine sed spiculis anguste lanceolatis lateraliter compressis vel subfusiformibus, anthoecio fertili lateraliter compresso valva valvulaque tenuibus distinctum.

Spiculae anguste lanceolatae, lateraliter compressae vel fusiformes, in ramis paniculae primariis applanatis vel triquetris magis minusve secundae, geminatae, altera subsessilis, altera pedicellata, subsessilis interdum redacta vel omnino suppressa, demum totae a pedicellis persistentibus disarticulatae. *Anthoecia* duo: inferius ad valvam redacta, superius ♀, tarde disarticulatum. *Glumae* subherbaceae, subaequales, acutae, exaristatae, vel inferior in aristam setaceam vel mucronem abeuns vel e sinu apicis minute 2-dentati aristata vel mucronata, raro etiam superior similiter mucronata, 5–7-nerves. *Valva anthoecii inferioris* glumis simillima, sed longior, spiculam aequans, 7- rarius 9-nervis, sine valvula, vacua. *Valva anthoecii superioris* a latere compressa valva inferiore inclusi navicularis, acuta, tenuiter chartacea, laevissima, nitidula, obscure 5-nervis. *Valvula* valde a latere compressa, dorso rotundata, 2-nervis, saepe nervo brevi ex apice decurrenti intracarinali addito et apicem versus subcarinata, late ad latera valva obtecta. *Lodiculae* 2, late cuneatae. *Stamina* 3, antheris linearibus. *Styli* capillacei, longiusculi; stigmata plumosa ex apice anthoecii exserta. *Caryopsis* ignota.—Gramina *perennia* (?) *vel annua, culmis multinodiis geniculato-adscendentibus.* Foliorum *laminae lanceolatae, plerumque latae, planae, tenues*; *ligulae tenuiter scariosae, breves.* Paniculae *rami simplices remoti, subsecundi, uti axis primaria angulata et saepe magis minusve triquetra.*

Species 5, madagascarienses.

P. Hildebrandtii, *Hack. in Sitzb. Akad. Wissensch. Wien*, vol. lxxxix (1884), p. 132; species *P. geminatae*, Hack., et *P. bromoidi*, Stapf

(*Oplismenus bromoides*, Bak.), comparanda, ab illa spiculis pro parte aristatis (haud omnibus exaristatis) paullo majoribus et glumis spiculam dimidiam plane excedentibus, ab hac habitu robustiore, foliorum laminis multo majoribus duplo vel ultra latioribus differt.

Gramen perenne (?), 0·5 m. altum. *Culmi* e basi decumbente adscendentes, simplices vel inferne ramosi, multinodi, teretes, exsiccando admodum contracti ideoque sulcati, internodiis magis minusve exsertis inferioribus fere omnino, superioribus saltem nodos versus pubescentibus. *Foliorum* vaginae teretes, laxae, superne plerumque a culmo solutae, magis minusve molliter pilosae, pilis patulis 3–4 mm. longis ; ligulae truncatae cum auriculis vaginae aequilongis striato-nervis fusae, scarioso-membranaceae, 1–1·5 mm. longae ; laminae e basi angustata lanceolatae, acute acuminatae, ad 7 cm. longae, 10–14 mm. latae, rigidulae, emarcidae rufescentes, subglabrae vel minores parce et tenuiter pubescentes, nervis numerosis approximatis ultimi ordinis 0·2–0·25 mm. inter se distantibus. *Paniculae* terminales vel nonnullae e foliorum superiorum axillis additae, angustae, quae culmos terminant longe pedunculatae et ad 15 cm. longae, caeterae multo breviores, erectae, rhachi gracili triquetra laevi inferne et ad nodos tenuiter pubescente ; rami solitarii, 1–4 cm. distantes, subsecundi, ad 5 cm. longi, graciles, a basi spiculigeri, angulati, laeves. *Spiculae* praeter terminales geminatae, subsecundae, altera subsessilis, altera pedicellata, pedicello ad 3 mm. longo apice obsolete cupulato, linearilanceolatae, a latere compressae, 6–7 mm. longae, virides. *Glumae* a latere visae anguste lanceolatae, carinatae, nervoso-striatae, 7-nerves, glabrae vel parce pilosae, inferior quam spicula triente brevior, acuta vel saepe (pedicellata) in aristam gracilem rectam ad 8 mm. longam producta, superior paullo longior, acuta, exaristata. *Valva anthoecii inferioris* glumis simillima, spiculam aequans, omnino vacua. *Valva anthoecii superioris* anguste lanceolata, acuta, 5·5–6 mm. longa, glabra, laevis, tenuissime 5-nervis, cum valvula paullo breviore. *Antherae* 4 mm. longae.

Madagascar : Imerina ; Andrangoloaka, in primeval forest, *Hildebrandt*, 3759 (in part in the Kew specimen).

The genus *Poecilostachys* was considered by its author to be allied to *Lophatherum*, and one of Hackel's species, viz. *P. geminata*, was in fact described originally as *Lophatherum geminatum*. There is, no doubt, a considerable superficial resemblance between the two genera ; but the former has panicoid and the latter typically poaoid spikelets, as was pointed out by Hackel himself. The affinity of *Poecilostachys* lies clearly with *Oplismenus*, Beauv., from which it differs in its slender,

laterally much compressed spikelets, its similarly compressed fertile floret and its thin valve and valvule. The awns are also less developed than in *Oplismenus* and mostly confined to the lower glume, or they are reduced to a mucro or quite suppressed. Awned and awnless spikelets may occur in the same inflorescence, whilst in *P. geminata*, Hack., all are awnless. The awns where present are of the type of those of *Oplismenus Burmannii*, which is, however, quite different in other respects.

In the Kew collections 5 species referable to *Poecilostachys* are present. Their characters are set out in the following key :—

Spiculae omnes vel saltem nonnullae aristatae, glumae (saltem superior) spiculam mediam plane superantes.

Laminae lanceolatae vel lineari-lanceolatae, 13–22 mm. latae; culmi robustiores.

Folia uti tota planta glaberrima; laminae nervi ultimi ordinis fere 0·5 mm. inter se distantes; ligula firma, 2–3 mm. longa cum vaginae auriculis aequilongis nervoso-striatis fusa.

1. *P. Baronis*, Stapf (n. sp.).

Folia, imprimis ad vaginas, pilosa; laminae nervi ultimi ordinis approximati, 0·2–0·25 mm. inter se distantes.

Foliorum laminae lanceolatae, ad 7 cm. longae, circiter 5–6-ies longiores quam latae, subglabrae, vaginis magis minusve pilosis, pilis ad 4 mm. longis; ligula scariosa, 1–1·5 mm. longa, lateraliter cum vaginae auriculis aequilongis fusa; glumae et valva inferior prominenter nervoso-striatae, illae huius $\frac{2}{3}$ aequantes vel longiores.

2. *P. Hildebrandtii*, Hack.

Foliorum laminae lineari-lanceolatae, ad 15 cm. longae, circiter 10-ies longiores quam latae; folia ubique molliter pilosa, vaginarum pilis ad 8 mm. longis; ligula brevissima, chartacea, ad margines vaginae exauriculatae decurrens; glumae et valva inferior leviter nervoso-striatae; gluma inferior interdum spiculam mediam haud superans vel ea paullo brevior, superior semper plane longior.

3. *P. mollis*, Stapf (n. sp.).

Laminae lineares vel lanceolato-lineares, ad 6 mm. latae; culmi debiles.

4. *P. bromoides*, Stapf (n. comb.).

Spiculae omnes exaristatae; glumae ad spiculam mediam attingentes vel paullo breviores; folia, praeter vaginarum margines densissime

ciliatas, glaberrima ; laminae lineari-lanceolatae, ultra 20 cm. longae, 10–11-ies longiores quam latae ; ligulae brevissimae, vaginae obsolete auriculatae.

5. *P. geminata,* Hack.

These species are represented in the Kew Herbarium by the following specimens :

1. *P. Baronis,* Stapf ; North-West Madagascar, *Baron,* 5284 ; South-East Madagascar ; Tanala country, Ambohimitombo forest, *C. F. Major,* 209.
2. *P. Hildebrandtii,* Hack. (see above).
3. *P. mollis,* Stapf ; South-East Madagascar ; Tanala country, Tvohimanitra forest, *C. F. Major,* 86.
4. *P. bromoides,* Stapf [*Oplismenus bromoides,* Bak. in Journ. Linn. Soc. vol. xxi. p. 452]; Central Madagascar, *Baron,* 3213.
5. *P. geminata,* Hack. ; Central Madagascar, *Baron,* 1061, 3226 ; Imerina ; Andrangoloaka, in primeval forest, mixed with *P. Hildebrandtii, Hildebrandt,* 3759.—O. Stapf.

Fig. 1, ligule ; 2, part of inflorescence ; 3, lower glume ; 4, upper glume ; 5, valve of lower floret ; 6, fertile floret ; 7, its valve ; 8, its valvule with flower. *All enlarged.*

M S delt et lith

Tabula 3072.

CHLOACHNE SECUNDA, *Stapf*.

Gramineae. Tribus Paniceae.

Chloachne, *Stapf*. Genus novum *Poecilostachyi*, Hack., affine, sed spiculis turgidulis, omnino muticis, glumarum et valvulae inferioris apicibus compressis herbaceis distinctum.

Spiculae lanceolatae, a latere compressae, turgidulae, in ramis paniculae primariis, rarius secundariis, applanato-triquetris secundae, laterales geminatae, rarius ternatae, inaequaliter brevipedicellatae, una (inferior ; vel si tres, duae) saepe magis minusve redacta vel omnino rudimentaria, terminales solitariae, demum totae a pedicellis persistentibus disarticulatae. *Anthoecia* duo : inferius plerumque ad valvam et valvulam saepe rudimentariam redacta, raro ♂ ; superius ♀, maturum tarde disarticulatum. *Glumae* herbaceo-membranaceae, apice a latere admodum compressae, fere plicatae et herbaceae, strigoso-hirsutae, acutae vel acutissimae, 5-nerves, inferior quam superior paulo brevior. *Valva anthoecii inferioris* glumis simillima, longior, 7-nervis cum palea angusta, plerumque magis minusve redacta, rarius florem ♂ fovente. *Valva anthoecii superioris* a latere paullo compressi valva inferiore inclusi nisi sub anthesi lateraliter exserti navicularis acuta vel acutissima, tenuiter chartacea, laevissima, nitida, obscure 5-nervis, valvulae similis latera marginibus subrectis amplectens. *Lodiculae* 2, oblique cuneatae, crenulatae. *Stamina* 3, antheris linearibus. *Styli* capillacei, basi connati, longiusculi ; stigmata plumosa ex apice spiculae exserta. *Caryopsis* matura ignota.—Gramina *perennia culmis adscendentibus interdum e nodis radices flagelliformes aërias emittentibus*. Foliorum *laminae lanceolatae, molles ; ligulae tenuiter scariosae, breves*. Paniculae *rami simplices vel parce ramulosi, secundi vel subsecundi uti axis primaria triquetri vel applanato-triquetri*.

Species 21, africanae.

C. secunda, *Stapf* ; species unica.

Culmi adscendentes, multinodi, fistulosi, glaberrimi, laevissimi, internodiis visis inferioribus ad 8 cm. longis, radicibus aëriis ad 15 cm.

vel ultra longis. *Foliorum* vaginae 2·5–3·5 cm. longae, subherbaceae, magis minusve apertae, multistriatae, ad margines dense ciliatae, in dorso et ad conjunctionem laminae pilosae, pilis saepe tuberculis minutis insidentibus; ligulae 1 mm. longae, rotundato-truncatae; laminae lanceolatae, acute acuminatae, ima basi breviter in geniculum mobile exsiccando fuscescens contractae, 8–10 cm. longae, 1·5–2 cm. latae, molles, virides, ad margines scaberulae, utrinque pilis tuberculis insidentibus conspersae, costa tenui albida subtus admodum prominente rotundata, nervis lateralibus primariis utrinque 3–4, secundariis 5–7 interjectis, omnibus tenuissimis. *Panicula* secunda circiter 14 cm. longa, longe pedunculata, rhachi triquetra, angulis cartilagineis sublaevibus, faciebus prominenter striatis; rami inferiores remoti, ad 4 cm. longi, superiores approximati, multo breviores, solitarii, e basi vel fere e basi spiculigeri vel longiores cum interstitio 1–1·5 cm. longo inter spiculas basales et proximas interposito, eorum rhachi primariae simili nisi graciliore; pedicelli longiores ad 2 mm. longi, plerumque multo breviores, subangulati, apice discoideo-dilatati, minutissime granulosi vel scaberuli. *Spiculae* perfectae 6·5–7 mm. longae. *Glumae* pallide virides apicibus saturate viridibus, nervis supra prominulis; inferior 4–4·5 mm., superior ad 6 mm. longa, magis minusve scaberulo-pruinosae. *Valva inferior* spiculae longitudine; eius valvula angusta, saepe magis minusve redacta, vacua. *Valva superior* 4 mm. longa, acute acuminata, nitida. *Antherae* 2·5 mm. longae. *Stigmata* flavida, 2·5 mm. longa.

West Tropical Africa: Cameroons; Cameroon Peak, 900–1200 m., *Mann*, 1354, 2101.

Several inflorescences (some of them with the uppermost leaf attached to the peduncles) collected by A. Whyte in Nyasaland on the Masuku Plateau, between 6500 and 7000 feet, may represent another species of the genus described here. The panicles are less distinctly secund, the tips of the glumes more herbaceous and spreading, and the spikelets more gaping during flowering, thus imparting a slightly different facies to the plant. There is also frequently a ♂ flower with the lower floret. The name is intended to indicate the more or less herbaceous nature of the outer parts of the spikelets (χλόη, herb; ἄχνη, chaff).—O. Stapf.

Fig. 1, spikelet in flower; 2, lower glume; 3, upper glume; 4, valve of lower floret with reduced valvule; 5, fertile floret; 6, valve of the same; 7, valvule of the same with flower. *All enlarged.*

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Tabula 3073.

URANTHOECIUM TRUNCATUM, *Stapf.*

Gramineae. Tribus Paniceae.

Uranthoecium, *Stapf.* Genus novum affine *Xerochloae,* R. Br., a qua differt spicis exinvolucratis secundum axim spicae primariae applanatam infra nodos disarticulatam dispositis, glumis majusculis truncatis multinerviis.

Spiculae paucae, plerumque 3, in spicas breves secundum rhachin communem articulatam sessiles et ei adpressas distantes demum cum articulo rhachis communis delabentes dispositae. *Callus* nullus. *Glumae* inaequales, papyraceae, viridinerves, truncatae, superior longior. *Anthoecium inferius* neutrum; valva lanceolata caudato-acuminata, ad flexuras cartilaginea, caeterum tenuis; valvula similis sed brevior bicarinata; flos nullus. *Anthoecium superius* ♀ : valva chartacea oblonga, caudato-acuminata, nervis 5 obscuris; valvula similis, brevior. *Lodiculae* 2, cuneatae, multi-nervosae. *Stamina* 3; antherae minutae. *Styli* a basi liberi; stigmata plumosa. *Caryopsis* oblongo-ovoidea, dorso applanata, facie convexa; hilum late ellipticum, mediam caryopsin attingens. — Gramen *annuum, culmis fasciculatis ad* 20 *cm. altis.* Foliorum *laminae planae, molles; ligula ad ciliarum seriem redacta.* Spicae primariae *ad* 7·5 (*vel ultra*) *cm. longae, fragillimae.*

Species 1, australiensis.

U. truncatum, *Stapf* (comb. nov.); species unica.

Culmi ad 22 cm. alti, basi fasciculati, superne praeter inflorescentias simplices, paucinodi, erecti vel geniculato-adscendentes, valde compressi, ad angulos virides, caeterum straminei, glaberrimi. *Foliorum* vaginae inferiores scariosae, superiores herbaceae, laxiusculae, laevissimae; ligula ad ciliarum seriem redacta; laminae lineares, longe tenuiter attenuatae, acutae, 5–15 cm. longae, ad 4 mm. latae, planae, molles, laeves, glabrae. *Spicae primariae* fere per totam culmorum longitudinem dispositae, longe in vaginis inclusae, demum interdum longiuscule exsertae; pedunculi valde compressi; rhachis complanata, dorso glauco-viridis, facie praeter margines asperulas straminea, laevissima, glaberrima, infra nodos disarticulata. *Spicae*

secundariae plerumque 3 (rarius 2 vel 4), spiculatae, 1–1·5 cm. longae; rhachis rhachi communi similis, sed tenax, flexuosa, apice spicula rudimentaria terminata. *Spiculae* sessiles, subulato-lanceolatae, 1 cm. longae, pallide virides, glaberrimae. *Gluma* inferior late oblongo-linearis, late truncata, 3–4 mm. longa, pallida, nervis viridibus 6–7 exterioribus approximatis cum intermediis superne venis transversis conjunctis, superior oblonga (explanata ovato-oblonga), 5 mm. longa, truncatula vel emarginata, pallida, superne bicarinata, nervis 3 e carinis decurrentibus viridibus, intermediis multo tenuior. *Valva* inferior longitudine spiculae, acumine scaberulo, sub-7-nervis, nervis tenuibus, inter exteriores cartilagineo-incrassata, ejus palea 7 mm. longa, carinis anguste alatis, apice bidentata. *Valva superior* 7–8 mm. longa, minutissime rugulosa, e medio subulato-caudata subula scaberula; ejus valvula 5 mm. longa, lateribus inflexis tenuibus fere sese obtegentibus. *Antherae* oblongae, 0·5 mm. longae. *Styli* capillares 1·5 mm. longi; stigmata 2 mm. longa. *Caryopsis* fere 3 mm. longa.—*Rottboellia truncata*, Maiden et Betche in Proc. Linn. Soc. N.S.W., vol. xxxi. (1906) p. 741, tab. 69.

Australia: New South Wales; Yandama, *A. W. Mullen*.

The affinity of this grass with *Xerochloa* and *Stenotaphrum* is quite evident. The shape of the parts of the spikelet recalls that of species of *Xerochloa*, whilst their arrangement in small spikes on the fragile rhachis of a primary spike resembles that of *Stenotaphrum*. There is no structural resemblance with *Rottboellia*.—O. Stapf.

Fig. 1, ligule; 2, secondary spike, somewhat opened out; 3, lower glume; 4, upper glume; 5, lower floret; 6, valve of same, flattened out; 7, valvule of same, back view; 8, fertile floret, back view; 9, valvule with flower; 10, grain. *All enlarged.*

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Tabula 3074.

ODONTELYTRUM ABYSSINICUM, *Hack.*

GRAMINEAE. Tribus PANICEAE.

O. abyssinicum, *Hack. in Oestr. Bot. Zeit.* 1898, p. 86 ; species unica.

Gramen aquaticum, perenne, rhizomate brevi strigoso-hirsutum, radices longas crasse fibrilliformes nudas emittens. *Culmi* ima basi cataphyllis scarioso-membranaceis, exterioribus strigoso-hirsutis, interioribus (vel interdum omnibus) glabris circumdati, ultra 0·5 m. longi, fistulosi, ramosi, ut videtur fluitantes, multinodi, e nodis submersis radicantibus, radicibus copiose fibrilligeris, glabri, laeves, internodiis submersis inferioribus ob vaginas mox emarcidas nudis, caeteris vaginis inclusis vel breviter exsertis. *Foliorum* vaginae laxae, glabrae, purpurascentes vel inferiores albidae, submembranaceae ; ligulae breves, truncatae, ciliolatae ; laminae lineares, acutae, planae, 10–20 cm. longae, ad 7 mm. latae, ad margines et hinc inde ad nervos primarios scaberulae. *Racemi* in ramis terminales, solitarii, spiciformes, ad 7 cm. longi, anthesi basi vaginati, foliorum laminis superati, rhachi glabra crassiuscula ad pedicellorum insertionem excisa ; pedicelli crassiusculi, applanati, rhachi adpressi,4 mm. longi, scabri. *Involucrum* versus rhachim apertum, irregulariter 4–6-lobatum, scabrum, superne purpurascens, lobo uno interdum fere a basi libero angusto in aristam spiculam 1–2 cm. superantem asperam producto, caeteris dentiformibus brevibus vel elongatis. *Spiculae* in involucro solitariae, oblongo-lanceolatae, 12 mm. longae, pallidae. *Glumae* inaequales ; inferior ovata, minuta (vel nulla) vel ad 2 mm. longa, hyalina, enervis ; superior ovata vel ovato-lanceolata, membranacea, 5–6 mm. longa, 1–3-nervis. *Valva anthoecii inferioris* ♂ late oblongo-lanceolata, acuta, 12 mm. longa, membranacea, supra purpurascens, praeter nervos interdum superne scaberulos laevis, 9-nervis, cum valvula aequilonga carinis scaberulis. *Valva anthoecii superioris* ♀ inferiori simillima, nisi paullo angustior, laevissima, 7-nervis cum valvula ut in anthoecio inferiore. *Stamina* 3 ; antherae 6–7 mm. longae, purpureae. *Ovarium* glabrum ; stigma atropurpureum, 12 mm. longum, ex apice spiculae exsertum.

EAST TROPICAL AFRICA : Abyssinia ; in stagnant water between Paffat and Dewra Tabor, 2700 m., *Schimper* (1863), 1121.

Hackel has already pointed out the affinity of this genus with *Pennisetum*, but he misunderstood the morphological value of the involucre. He considered it as made up of two additional much modified barren glumes, whereas it is clear that it is equivalent to the involucres of *Cenchrus*. *Pennisetum*, and *Plagiosetum*, and is formed by the fusion of an imperfect whorl of dilated bristles, not unlike that of *Plagiosetum*, but very much coarser. The longest of the bristles is more or less awnlike and almost free to the base.—O. Stapf.

Fig. 1, ligule; 2, spikelets with involucre; 3, involucres; 4, spikelet; 5, lower glume; 6, upper glume; 7, valve of lower floret; 8, valvule and stamens of the same; 9, valve of upper floret; 10, valvule of the same; 11, flower. *All enlarged.*

M. S. delt. et lith.

Tabula 3075.

DANTHONIOPSIS GOSSWEILERI, *Stapf.*

Gramineae. Tribus Arundinelleae.

Danthoniopsis, *Stapf.* Genus novum *Trichopterygi*, Nees, affinis, sed spiculis turgidulis pallide virescentibus vel livido-purpurascentibus, valva fertili more *Danthoniae* alte bifida et transverse barbata, valvulae anthoecii fertilis carinis alato-appendiculatis insigne.

Spiculae lanceolatae, pedicellatae, paniculatae ; rhachilla brevissima, infra valvam utramque disarticulata, glabra, haud ultra anthoecium fertile producta. *Anthoecia* duo, heteromorpha ; inferius ♂, superius ♀. *Glumae* persistentes, tenuiter scarioso-membranaceae, pallide virescentes vel livide purpurascentes, inaequales, 3–5-nerves, glabrae. *Anthoecii inferioris valva* glumae superiori simillima, 7-nervis ; ejus valvula tenuiter membranacea, lateribus inflexis exauriculatis, carinis anguste tenuiterque alatis alis superne sensim desinentibus ; callus brevissimus, obtusus, ebarbatus. *Anthoecii superioris valva* dorso applanata, membranacea, pallide virescens, fere ad medium bifida, lobis acutis, 9-nervis, transverse barbata ; arista inter lobos orta, geniculata, columna torta ; ejus valvula ei anthoecii inferioris similis, sed carinis firmioribus a basi ad medium alatis alis varie in dentem productis, raro brevissimis ; callus brevis, obtusissimus, barbatus. *Lodiculae* 2, cuneatae, subcornutae, carnosae. *Stamina* 3 in utroque anthoecio. *Ovarium* obovoideum, glabrum ; styli longi, distincti, glabri ; stigmata plumosa, sub apice lateraliter exserta. *Caryopsis* ignota.—Gramen *dense caespitosum.* Foliorum *laminis latiusculis planis duriusculis* ; *ligula ad seriem pilorum redacta.* Paniculae *angustae, ramis longiusculis suberectis.*

Species 1, angolensis.

D. Gossweileri, *Stapf ;* species unica.

Gramen perenne, compacte caespitosum. *Culmi* teretes, 3-nodi, glabri, laeves, ad 5 dm. alti (inflorescentiis demptis), internodiis longe exsertis. *Folia basalia* cum turionibus paucis arcte congesta, saepe numerosa, eorum vaginae acute carinatae, fulvo-sericeo-tomentosae, 5–7 cm. longae, superne attenuatae et sensim in laminam abeuntes ;

laminae firmae, late lineares, e basi saepe longe attenuatae, apice setaceo-acuminatae, ad margines cartilagineos crispae, ad 25 cm. longae, ad 1·3 cm. latae, utrinque tomentellae, superne deinde glabrescentes; costa albida, nervis lateralibus numerosis haud conspicuis. *Folia caulina* vaginis teretibus arctis ad nodos longe copiose barbatis, laminis multo angustioribus brevioribusque supra glabris nisi margines versus subtomentellis, nervis distinctioribus. *Panicula* ob ramos suberectos angusta, ad 2 dm. longa; rhachis gracilis, glabra, laevis, subangulata; rami plures e nodis, inaequales, longiores ad 6 (rarius 8) cm. longi, vel fere a basi divisi vel ad 1–2 cm. indivisi, ramulis brevibus 1–3-spiculatis, omnes uti ramuli et pedicelli filiformes, basi magis minusve pubescentes, superne scaberulae; pedicelli longitudine valde varii, interdum perbreves. *Spiculae* 8–10 mm. longae. *Glumae* glabrae; inferior ovato-oblonga, obtusiuscula vel subacuta, 4 mm. longa, nervis 3 prominentibus, superior longitudine spiculae, caudato-acuminata, acumine lineari apice explanato obtusiusculo nervis 5, quorum 3 prominentibus. *Valva inferior* 7–8 mm. longa; *superior* late ovata, 7 mm. longa, pilorum fasciculis 8 in unam seriem transversam dispositis barbata et basi pilosa, caeterum glabra; aristae columna 3 mm. longa applanata in dorso atro-fusca, glabra, facie in statu torso extra spectante albida, adpresse sericea. *Antherae* 4–4·5 mm. longae. *Styli* 4 mm. longi; stigmata pallida 2·5–3 mm. longa.

West Tropical Africa: Angola; country of the Benguellas and Ambuellas, *Gossweiler*, 2766, 4053.

Although the close affinity of *Danthoniopsis* with *Trichopteryx* is beyond doubt, I have not been able to connect it more particularly with any of the known species of *Trichopteryx*. The more herbaceous texture of the glumes and valves, the readiness with which the lower floret disarticulates, and the peculiar wing-like appendage of the palea of the fertile floret seem to separate *Danthoniopsis* most generally from *Trichopteryx*, while the deeply bifid, transversely bearded valve of the fertile floret and its very short and obtuse callus distinguish it from almost all the species of *Trichopteryx*. *T. Dregeana* and its immediate allies alone exhibit a similar structure, but they have on the other hand the characteristic brown, scarious glumes, the very tardily separating barren florets, and the unappendaged keels of the palea of *Trichopteryx*. The fertile florets resemble very much those of certain species of *Danthonia*; hence the name *Danthoniopsis*.—O. Stapf.

Fig. 1, ligule; 2, portion of blade with wavy, cartilaginous margin; 3, spikelet; 4, lower glume; 5, upper glume; 6, ♂ floret; 7, valve of the same; 8, valvule of the same; 9, fertile floret, front view, showing the appendaged keels of the valvule; 10, valve of the same; 11, valvule, front view with lodicules and pistil; 12, same, back view. ***All enlarged.***

M.G del. et lith

Tabula 3076.

SEHIMA NERVOSUM, *Stapf.*

Gramineae. Tribus Andropogoneae.

S. nervosum, *Stapf in Prain, Fl. Trop. Afr.* vol. ix. p. 36; affine *S. ischaemoidi,* Forsk., sed perenne, spiculis utriusque generis minoribus, et gluma inferiore spiculae pedicellatae subbidentata distincta.

Gramen perenne, dense caespitosum, 60–70 cm. altum. *Culmi* erecti, graciles, teretes, saepius simplices, circiter 4-nodes, internodiis superioribus exsertis, glabri, laeves nisi versus inflorescentiam scaberuli. *Folia* glauca; vaginae arctae, teretes, laeves vel sublaeves, glabrae vel parce hirsutae; ligulae ad limbum rigide ciliatum redactae; laminae lineares, longe in apicem setaceum attenuatae, ultra 30 cm. longae, ad 5 mm. latae, rigidae, scaberulae, glabrae, costa albida. *Racemi* solitarii, 7·5–11·5 cm. longi, erecti; articuli pedicellique paralleli, sublineares, subcompressi, 5–6·5 mm. longi, praeter margines dense albo-ciliatos glabri. *Spiculae sessiles* lanceolato-lineares vel lineares, acuminatae, 10–11·5 mm. longae, pallide virides, callo breviter barbato. *Glumae* subaequales; inferior praeter apicem 2-dentatum membranaceum subchartacea vel chartacea, infra medium profunde canaliculata, carinis acutis, carina exteriore plerumque sursum alata, nervis inter carinas 4 cum venulis transversis in parte superiore; superior subchartacea, paulo brevior, navicularis, apice carinata, carina in setam 14–16 mm. longam excurrente, nervis 5 cum venulis transversis, marginibus ciliatis. *Anthoecium inferum* ♂: valva oblonga 6 mm. longa, hyalina, ciliata, tenuiter 2-nervis; valvula aequilonga, anguste linearis. *Anthoecium superum* ♀: valva oblongo-lanceolata, bifida, 5 mm. longa, hyalina, 3-nervis, ciliata, arista gracili ad 35 mm. longa ad columnae brunneo-fulvae spiras minutissime ciliata; valvula aequilonga, linearis, ciliata, 2-nervis. *Spiculae pedicellatae* lanceolatae, acuminatae, 11–13 mm. longae, virides vel purpureo-tinctae, glabrae. *Gluma* inferior sub-2-dentata, longe ciliata, carinis angustissime alatis et ex alis rigide ciliatis, nervis inter carinas 5; gluma superior lanceolata, longe tenuiter acuminata, hyalina, ciliata, 3-nervis. *Anthoecium inferum* ut in spicula sessili; *superum* simile; stamina saepe hebetata vel suppressa.—*S. macrostachyum,* Hochst. ex Hack. Mon. Androp. p. 245. *Andropogon nervosus,* Rottl. apud Willd. in Verh. Naturf. Fr. Berlin, vol. iv. (1803), p. 218.

A. striatus, Klein apud Willd. Spec. Pl. vol. iv. p. 903. *A. tacazensis*, Steud. Syn. Pl. Glum. vol. i. p. 369. *A. macrostachys*, Anderss. in Schweinf. Beitr. Pl. Aeth. p. 306. *Ischaemum laxum*, R.Br. Prodr. p. 205; Benth. Fl. Austral. vol. vii. p. 522; Hook. f. Fl. Brit. Ind. vol. vii. p. 136 (pro parte). *I. laxum* α *genuinum*, Hack. l.c. *I. nervosum*, Thw. Enum. Pl. Zeyl. p. 365. *I. macrostachyum*, A. Rich. Tent. Fl. Abyss. vol. ii. p. 472. *Pollinia striata*, Spreng. Pug. vol. ii. p. 12. *Hologamium nervosum*, Nees in Edinb. N. Phil. Journ. vol. xviii. p. 185.

North-Eastern Tropical Africa and Indo-Malayan Region. A xerophytic type. Africa: Abyssinia, Somaliland and Kenya (Nairobi). India: throughout the Deccan northwards to Rajputana and Behar; Ceylon; Inner Burma to Siam. Tropical North Australia.

Hackel l.c. has already suggested that *Sehima*, which he treated as a subgenus of *Ischaemum*, should perhaps be considered rather a distinct genus.—O. Stapf.

Fig. 1, pair of spikelets; 2, pedicel; 3, lower glume; 4, upper glume; 5, valve of lower floret; 6, valvule; 7, valve of upper floret; 8, valvule of same (2–8 of sessile spikelet); 9, upper glume; 10, valve of lower floret; 11, valvule of same; 12, valve of upper floret; 13, valvule of same (9–13 of pedicelled spikelet). *All enlarged.*

J.S. del. M.S. lith

Tabula 3077.

ANDROPTERUM VARIEGATUM, *Stapf.*

Gramineae. Tribus Andropogoneae.

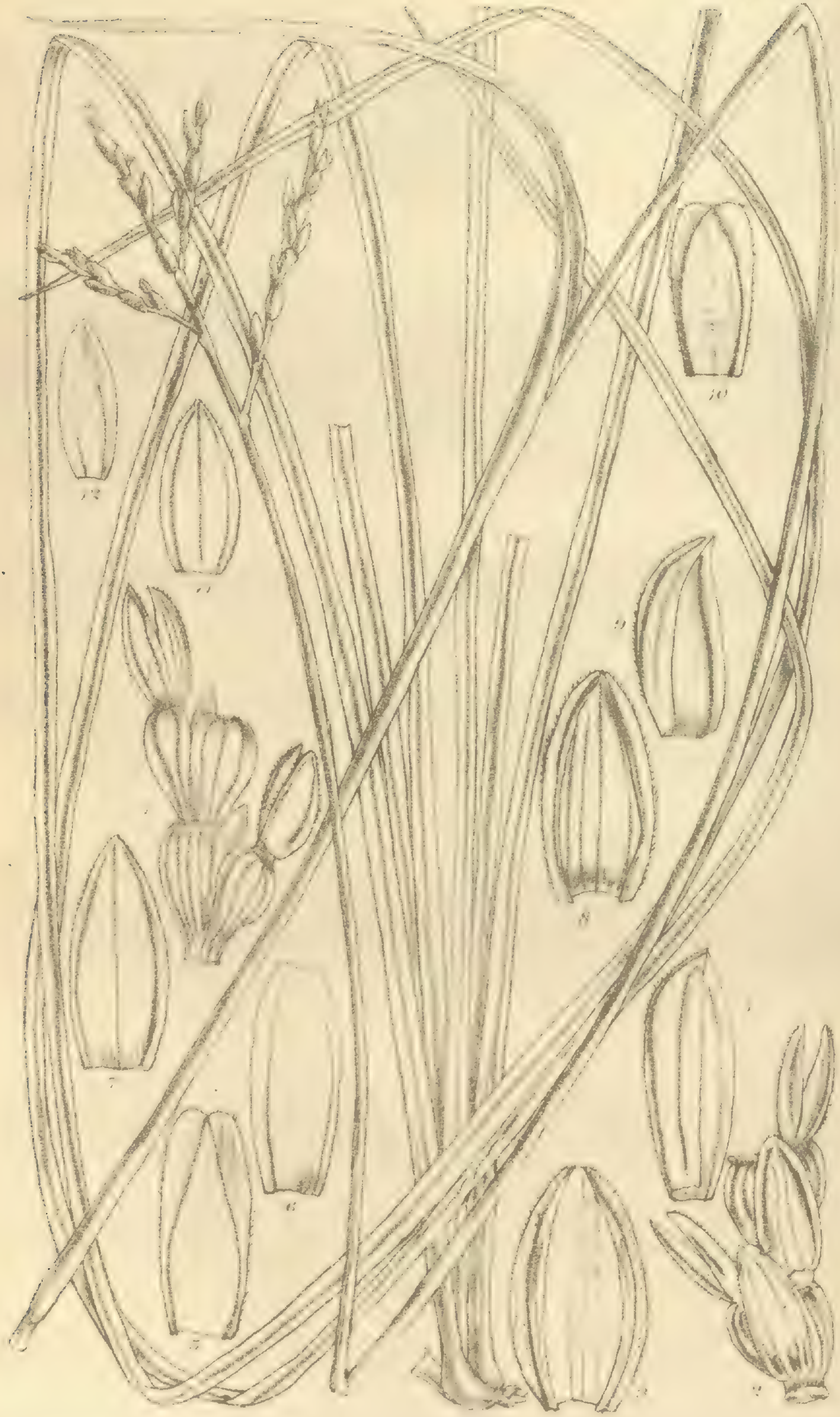
A. variegatum, *Stapf in Prain, Fl. Trop. Afr.* vol. ix. p. 38; species unica.

Gramen probabiliter perenne. *Culmi* erecti, ultra 60 cm. alti, subgraciles, teretes, inferne saepius ramosi, ramis appressis, glabri vel superne pilosi. *Folia* subglauca; vaginae arctae, teretes, glabrae vel hirsutae, ad nodos barbatae; ligulae ad limbum rigide ciliatum redactae; laminae lineares, longe in apicem tenuem attenuatae, ad 20 cm. longae, 12 mm. latae, utrinque pilosae vel infra albido-tomentosae, ad margines spinulose ciliatae, costa gracili albida. *Racemi* solitarii in pedunculis gracilibus longe exserti, 5–7·5 cm. longi; articuli pedicellique lineari-clavati, subaequales, illi pertenues, hi dorso subconvexi, 3 mm. longi, praeter margines dense ciliatos et lineam dorsalem glabri et nitidi, horizontaliter disarticulati. *Spiculae sessiles* lanceolatae, subacuminatae, ad 5 mm. longae, pallide virides. *Glumae* subaequales, subchartaceae; inferior linearis, a latere angusta, profunde sulcata, carinis ciliatis, nervis inter eas 0; superior paulo longior, navicularis, a latere oblique lanceolata, superne carinata, carina in alam obtusam mucroni adnatam producta, 7-nervis, minute ciliolata. *Anthoecium inferum* ♂, 4 mm. longum; valva oblonga, hyalina, tenuissime 3-nervis; valvula similis nisi angustior et 2-nervis. *Antherae* 2 mm. longae. *Anthoecium superum* ♀, infero subaequilongum; valva oblonga, alte bifida lobis anguste lanceolatis acutis, basi 3-nervis, eciliata; arista ad 10 mm. longa, gracilis, medio geniculata. *Antherae* minutae, hebetatae, in filamentis brevibus. *Spiculae pedicellatae* a latere lineari-oblongae, obtusae, pallidae, uno latere purpureo marginatae, 6–7 mm. longae, glabrae. *Glumae* aequales; inferior lanceolata, valde asymmetrica, uno latere tantum inflexa, flexura angusta, e carina late alata, ala lateraliter incurva, nervis 7; superior navicularis, a latere lineari-lanceolata, a medio anguste alata, nervis 7 tenuibus. *Anthoecia* anthoecio infero spiculae sessilis similia. *Antherae* anthoecii inferi 3 mm., superi 2 mm. longae.

Tropical Africa. Nyasaland: Namasi, *Cameron*, 17; Masuku Plateau, 1800–2000 m., *Whyte*.

The affinity of *Andropterum* with *Sehima* and through it with *Ischaemum* is quite evident in so far as the general structure of the spikelets is concerned; at the same time it is so much specialised in detail and facies that it deserves to be treated as a distinct genus.—O. Stapf.

Fig. 1, pair of spikelets and adjacent joint; 2, lower glume; 3, upper glume; 4, valve of lower floret; 5, valve of upper floret; 6, valvule of upper floret; 7, anthers; 8, pistil (2–8 of sessile spikelet); 9, diagram of pedicelled spikelet; 10, lower glume with wing straightened out; 11, upper glume; 12, valve of lower floret; 13, valve of upper floret; 14, valvule of upper floret (10–14 of pedicelled spikelet). *All enlarged.*



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Tabula 3078.

THYRSIA INFLATA, *Stapf.*

Gramineae. Tribus Andropogoneae.

T. inflata, *Stapf in Prain, Fl. Trop. Afr.* vol. ix. p. 49; ab altera specie africana (*T. huillensi,* Stapf) differt articulis pedicellisque superne admodum inflatis crasse clavatis, spiculis maioribus.

Gramen perenne, caespitosum, ad 1 m. altum. *Culmi* erecti, basi vaginarum basibus vetustis vestiti, simplices, teretes, 4–5-nodes, glabri laevesque nisi ad inflorescentiam scaberuli et pilosuli. *Foliorum* vaginae magis minusve pilosae vel glabrae, ad nodos subbarbatae, basales compressae; ligulae membranaceae, brevissimae, ciliolatae; laminae lineares, longe in apicem tenuem attenuatae, ultra 30 cm. longae et 5–6 mm. latae, plicatae vel planae, molles vel rigidulae, molliter hirsutae vel glabrescentes, costa nervisque tenuibus. *Racemi* 3–4 in rhachi communi fragili 15–18 mm. longa subterete pilosa racemose dispositi, breviter pedunculati, circiter 3 mm. lati, rigidi, glaberrimi, pallide virides, purpureo-suffusi; articuli superne admodum inflati, apice excavati, 3–4 mm. longi, dorso valde convexi, facie subconcavi, laeves, distincte nervoso-striati, horizontaliter truncati; pedicelli articulis similes, sed angustiores et magis minusve curvati, illis paulo breviores et postice subcontigui. *Spiculae sessiles* ovato-oblongae, callo brevissimo subannulari incluso 4 mm. paululo excedentes. *Glumae* aequales; inferior coriacea, secundum carinas minute ciliolata, inter eas chartacea et tenuiter 3–4-nervis, subobtuse vel minute emarginata, lateribus anguste inflexis; superior navicularis, tenuiter chartacea, a latere semi-ovata, subacuta, carinata, utrinque nervo 1 submarginali. *Anthoecium inferum* ad valvam hyalinam late lanceolatam vel oblongam 2-nervem superne ciliolatam redactum. *Anthoecium superum* ♀: valva late lanceolata, acuta, hyalina, 3-nervis; valvula paulo brevior, oblonga, subobtusa, obscure 2-nervis. *Antherae* 2·5–3 mm. longae. *Stigmata* prope spiculae basin exserta. *Caryopsis* oblonga, a dorso valde compressa, 1·5 mm. longa, scutello ultra medium producto. *Spiculae pedicellatae* varie evolutae, mox ♂ et tunc sessilibus simillimae, mox hebetatae et interdum ad glumas 2 vel 1 minutas redactae.

Tropical Africa. Belgian Congo: Katanga; Chisangwe, *Homblé,* 34; Elizabethville, *Homblé,* 51.

To this genus belongs, apart from *T. huillensis* mentioned above and another imperfectly known species from Nyasaland (see Stapf l.c. p. 50), *T. Zea*, Stapf (*Rottboellia Zea*, C.B.Cl. ; *R. thyrsoidea*, Hack.), which in Hackel's Monograph of the Andropogoneae (p. 283) represents a distinct monotypic subgenus *Thyrsostachys*. *T. Zea* ranges from the Khasia Hills to Tonkin. It is characterised by large panicles formed of very numerous slender racemes, pseudo-verticillately arranged. The structure and shape of the spikelets are the same as in the African species.—O. Stapf.

Fig. 1, two pairs of spikelets, back view of raceme ; 2, same, front view of raceme ; 3, lower glume from within ; 4, upper glume ; 5, valve of lower floret, with flaps spread out ; 6, valvule of same ; 7, valve of upper floret (3–7 of sessile spikelet) ; 8, lower glume ; 9, upper glume ; 10, valve of lower floret, with flaps spread out ; 11, valve of upper floret ; 12, valvule of same (8–12 of fully developed pedicelled spikelet). *All enlarged.*

M.S del.A.W.D.11th

Tabula 3079.

JARDINEA GABONENSIS, *Steud.*

Gramineae. Tribus Andropogoneae.

J. gabonensis, *Steud. in Flora*, 1850, p. 229 (*nomen*) ; *Syn. Pl. Glum.* vol. i. p. 360 ; a caeteris speciebus differt racemis rigidissimis fragillimis, spiculis pedicellatis ad glumam minutam redactis vel plane suppressis.

Gramen perenne, caespitosum, ad 2·5 m. altum. *Culmi* erecti, teretes, glabri laevesque, simplices vel superne hincinde ramos foliatos edentes. *Foliorum* vaginae firmae, laeves, glabrae vel sparse molliter pilosae, inferiores admodum compressae, diu persistentes ; ligulae brevissimae, membranaceae, ciliolatae et e dorso longe pilosae ; laminae lineares, in apicem tenuem attenuatae, basi sensim in vaginam abeuntes, ad 30 cm. longae, ad 8 mm. latae, rigidae, planae, praeter basin plerumque longe sericeo-pilosam glabrae, ad margines scabrae, costa inferne incrassata. *Racemi* saepe 12, oppositi vel sparsi in rhachi communi suberecti, simplices vel infimi compositi, rigidi, fragiles, ultra 15 cm. longi, viridi-flavescentes ; rhachis communis ad 10 cm. longa, acute angulata, ad nodos interdum tomentello-barbulata ; pedunculi racemorum infimorum ad 2·5 cm. longi, caeteri brevissimi ; articuli lineares, subclavati et apice excavati, 6–8 mm. longi, dorso rotundati, facie subconcavi, ad margines et nervos virides, laeves vel scabridae ; pedicelli lineares, teretes, admodum compressi, articulis circiter aequilongi iisque contigui vel basi paululo recedentes, secundum marginem interiorem ciliolati. *Spiculae sessiles* lineari-lanceolatae, 6–8 mm. longae, callo annuliformi brevissime barbato. *Glumae* subaequales, chartaceae ; inferior dorso plana, acute vel subacute acuminata, saepe in mucronem pungentem excurrens, glabra, ad latera et magis minusve etiam trans basin muricato-tuberculata, carinis superne rigide ciliolatis, nervis inter eas 3 facie distinctis ; superior paulo brevior, navicularis, a latere linearis, subacuta, mutica, glabra, 5-nervis, in carina spinulose ciliolata, nervis lateralibus per paria margine approximatis. *Anthoecium inferum neutrum* : valva lineari-lanceolata, acuta, 5–6 mm. longa, hyalina, ciliata, 2–3-nervis, cum vel sine valvula brevi. *Anthoecium superum* ♀ : valva ei anthoecii inferioris similis cum valvula subbreviore 2-nervi. *Antherae* 3 mm. longae. *Ovarium* apice pubescens. *Stigmata* purpurea, lateraliter exserta. *Spiculae pedicellatae* ad glumam lanceolatam vel subulatam

ad 3 mm. longam redactae vel plane suppressae.—Franch. Contr. Fl. Congo Franç. p. 12 (pro parte). *Rhytachne gabonensis*, Hack. Mon. Androp. p. 276; Th. & Hél. Durand, Syll. Fl. Congo, p. 623; Stapf in Prain, Fl. Trop. Afr. vol. ix. p. 51.

Tropical Africa. French and Belgian Congo.

The original of this species is a specimen in the Herbarium at Caën collected by Jardin on the Gaboon River.—O. Stapf.

Fig. 1, pair of spikelets; 2, lower glume, front view; 3, upper glume, back view; 4, valve of lower floret; 5, valvule of same; 6, valve of upper floret; 7, valvule of same (2–7 of sessile spikelet); 8, pedicelled spikelet and pedicel. *All enlarged.*

Tabula 3080.

LASIURUS HIRSUTUS, *Boiss.*

Gramineae. Tribus Andropogoneae.

L. hirsutus, *Boiss. Diagn.* sér. II. fasc. iv. p. 146; species unica (?).

Gramen perenne, caespitosum vel basi suffruticosum, ad 1 m. altum; rhizoma obliquum, interdum lignosum, arcte cataphyllis appresse hirsutis vel tandem glabrescentibus vestitum. *Culmi* erecti, basi ramosi, subgraciles, teretes, laeves vel basi subscabri et pilosi; prophylla ramorum inferiorum longa, saepe villosa. *Folia* glauca, inferiora congesta; vaginae arctae, teretes, glabrae vel parce ciliatae, laeves, infimae diu persistentes; ligulae ad pilorum seriem redactae; laminae lineares, longe in apicem tenuem attenuatae, convolutae vel planae, inferiores interdum ultra 30 cm. longae, 6 mm. latae, superiores multo breviores, angustiores, omnes glabrae vel supra ligulam pilis paucis consitae, magis minusve scaberulae, costa lata albida, nervis prominulis. *Racemi* solitarii, erecti, spiciformes, densi, ad 12 cm. longi, 6 mm. lati, dense villosi, fragiles, basi vagina summa circumdata vel ex ea exserta, spiculis 3-nis (raro 2-nis) cum quoque articulo; rhachis ad nodos barbata; articuli lineares, 4–5 mm. longi, e dorso admodum compressi et subconvexi, facie subplani et carinati, apice horizontaliter truncati, glabri vel dorso villosi vel pubescentes, ad margines ciliolati; pedicelli anguste lineares, 3–3·5 mm. longi, praeterea articulis similes, si spiculae 2-nae adsint pari subappositi in altero latere articuli, si solitariae articulo approximati sed haud contigui et uni eius lateri paralleli. *Spiculae sessiles* lanceolatae, 7–9 mm. longae, pallide virides, callo annuliformi angustissimo pilis densis erectis ad 6 mm. longis cincto. *Glumae* inaequales; inferior acuminata, inaequaliter 2-dentata, 2–4 mm. longa, subcoriacea, in dorso plana et plerumque glabra, sursum 2-carinata, fere a basi dense longe ciliata, nervis inter carinas 4 saepe anastomosantibus; superior brevior, navicularis, a latere oblique lanceolata, acuta, membranacea, carinata, 5-nervis, sursum ciliata. *Anthoecium inferum* ♂ vel hebetatum; valva oblonga, subacuta, 4 mm. longa, hyalina, 3-nervis, glabra; valvula anguste oblonga, valvae aequilonga vel paulo longior, hyalina, 2-nervis. *Anthoecium superum* infero fere aequilongum et valva valvulaque ut in illo. *Antherae* 2·5–3 mm. longae. *Stigmata* lateraliter exserta. *Caryopsis* oblonga, a dorso leviter compressa.

Spiculae pedicellatae sessilibus similes, 5–7 mm. longae, callo indistincto glabro, utroque anthoecio ♂ vel hebetato.—Stapf in Prain, Fl. Trop. Afr. vol. ix. p. 68. *Saccharum hirsutum*, Forsk. Fl. Aeg.-Arab. p. 16. *Rottboellia hirsuta*, Vahl, Symb. vol. i. p. 11 ; Delile, Fl. Aegypt. Illustr. tab. xiv. fig. 1 ; Hack. Mon. Androp. p. 311. *Ischaemum mastrucatum*, Trin. in Mém. Acad. Petersb. ser. 6, vol. ii. p. 298. *I. hirsutum*, Nees ex Steud. Syn. Pl. Glum. vol. i. p. 261. *Coelorrhachis hirsuta*, Brongn. apud Decne in Ann. Sci. Nat. ser. 2, vol. ii. p. 13. *Elionurus hirsutus*, Munro apud Benth. in Journ. Linn. Soc. vol. xix. p. 68 ; Boiss. Fl. Or. vol. v. p. 466 ; Hook. f. Fl. Brit. Ind. vol. vii. p. 162.

North-East Africa to India. Africa : from Egypt along the littoral of the Red Sea to Somaliland. Asia : tropical Arabia ; through Baluchistan and Afghanistan to Scind and the Punjab, as far as the Salt Range.—O. Stapf.

Fig. 1, trio of two sessile and one pedicelled spikelet, with the pedicel in front ; 2, same with the joint in front ; 3, sessile spikelet with the lower glume removed ; 4, lower glume, front view ; 5, valve of lower floret ; 6, valvule of same ; 7, valve of upper floret ; 8, valvule of same (4–8 of sessile spikelet) ; 9, upper glume ; 10, lower floret ; 11, upper floret (9–11 of pedicelled spikelet). *All enlarged.*

O.S. anal.A.W.D lith

Tabula 3081.

COELORRHACHIS LEPIDURA, *Stapf.*

Gramineae. Tribus Andropogoneae.

C. lepidura, *Stapf in Prain, Fl. Trop. Afr.* vol. ix. p. 79; ab altera specie africana (*C. afraurita,* Stapf) racemis folia ramorum longe superantibus pedicellis inappendiculatis distincta.

Gramen perenne, 1 m. (vel ultra) altum, glabrum. *Culmi* erecti, robusti, multinodes, ramosi, ramis solitariis vel fasciculatis inaequalibus, longioribus iterum divisis, omnibus in paniculam laxam foliatam collectis. *Foliorum* vaginae laeves, tenuiter nervoso-striatae, inferiores carinatae, intermediae superioresque quam internodii breviores; ligulae brevissimae, membranaceae, truncatae; laminae lineares, longe a basi attenuatae, acutae, complicatae, caulinae ad 15 cm. longae, 6 mm. latae, rigidulae, rubescentes, praeter margines scabros laeves, costa infra acute carinata. *Panicula* ad 60 cm. longa, ramis ramulisque distantibus foliis laminas angustas gerentibus vel ad spathas redactis suffultis. *Racemi* ramos ramulosque terminantes, leviter compressi, erecti vel subnutantes, eximie dorsiventrales, antice spiculas sessiles more squamarum piscinarum imbricatas, postice articulos pedicellosque exhibentes, glabri, straminei brunneo-variegati, ad 10 cm. longi, et ultra 2 mm. lati; articuli cuneati triquetri, 2 mm. longi, horizontaliter truncati, glabri, laeves; pedicelli duplo longiores, lineares, a dorso compressi, articulis paralleli et ab eis recedentes. *Spiculae sessiles* a dorso admodum compressae, late vel elliptico-oblongae, 4 mm. longae, glabrae, callo brevi. *Glumae* subaequales; inferior dorso fere plana, coriacea, obtusa, emarginata, carinis alatis, alis superne latioribus, nervis inter carinas obscuris 4–5; superior paululo brevior, oblonga, acuta, tenuiter chartacea, carinata, 3-nervis. *Anthoecium inferum* ad valvam ovato-oblongam acutam 2·5 mm. longam tenuiter hyalinam obscure 2-nervem redactum. *Anthoecium superum*: valva ei anthoecii inferioris similis, sed paulo brevior, 3-nervis; valvula valvae similis et aequilonga, truncatula, sub-2-nervis. *Antherae* 1 mm. longae. *Spiculae pedicellatae* ad glumas 2-nas lanceolatas brunneas 2–2·5 mm. longas redactae.

Tropical Africa. Portuguese East Africa: Zambesi Delta; Kongoni River, *Kirk.*

The standard species of the genus *Coelorrhachis* as understood here is *C. muricata*, Brongn. in Duperry, Voy. Coquille, Bot. vol. i. p. 65, t. 14 (1829), which in 1833 was redescribed independently in Mém. Acad. Petersb. ser. 6, vol. ii. p. 250 as *Coelorrhachis glandulosa*, Trin. *Coelorrhachis* comprises twelve species, six of which are confined to the tropics of the Old World, and as many are found exclusively in the New World. Of the *Rottboelliae* of Hackel's monograph the species numbered 17–27 belong here, with the exception of 20, 22 and 23, which might more appropriately constitute a distinct American genus, ranging from the central and southern United States to Brazil.—O. Stapf.

Fig. 1, part of raceme, front view; 2, same in back view; 3, upper glume; 4, valve of lower floret; 5, valve of upper floret; 6, valvule of same (2–6 of sessile spikelet). *All enlarged.*

Pl.3082

M S. del. A.W.D. lith

Tabula 3082.

CHASMOPODIUM CAUDATUM, *Stapf.*

Gramineae. Tribus Andropogoneae.

C. caudatum, *Stapf in Prain, Fl. Trop. Afr.* vol. ix. p. 77; ab altera generis specie (*C. Afzelii*, Stapf), racemis ob glumas spiculae terminalis elongatas caudatis et spiculis potius ovatis quam oblongis distincta.

Gramen annuum, ad 3 m. altum. *Culmi* erecti, multinodes, e nodis inferioribus radicantes, teretes, superne ramosi, ramis brevibus appressis simplicibus omnibus tandem florentibus. *Foliorum* vaginae teretes, superne subcarinatae, glabrae vel pilis tuberculis insidentibus hirsutae, interdum ad nodos barbatae; ligulae ad seriem ciliarum brevium redactae; laminae lanceolato-lineares, basi angustae, apice setaceo-acuminatae, 25–50 cm. longae, 8–12 mm. latae, planae, potius flaccidae, utrinque scabrae, glabrae vel breviter pilosae, costa supra albida latiuscula. *Racemi* solitarii, culmos ramosque terminantes vel interdum uno laterali addito, spiciformes, cylindrici, fragillimi, ad 7·5 cm. longi, 3–4 mm. diametro, ob glumas spiculae terminalis elongatas quasi caudati, pallide virides, subglabri; articuli e basi anguste lineari clavati, apice excavati, 5 mm. longi, dorso convexi, scaberuli, facie concavi, uno margine ciliati; pedicelli articulis aequilongi, sed sursum minus dilatati et saepe fere lineares, basi spatio late oblongo ab iis recedentes (unde nomen generis), ciliati, ciliis eis articuli adjacentis oppositis. *Spiculae sessiles* a dorso leviter compressae, late ovatae, 6–7 mm. longae, pallidae, callo annuliformi angustissimo breviter barbulato. *Glumae* aequales; inferior dorso convexa vel fere plana subobtusa, 2-denticulata, coriacea, laevis glabraque, lateribus anguste inflexis, carinis superne in cristam vel alam obtusam dilatatis, nervis numerosis haud visibilibus nisi luce transmissa; superior navicularis, late ovata, subobtusa, subcoriacea, e carina sub apice breviter alata, ciliolata, venis 7–9. *Anthoecium inferum* ♂: valva glumae inferiori ambitu similis, sed hyalina, integra, 3-nervis; valvula valvam aequans, 2-nervis. *Anthoecium superum* paulo brevius, caeterum infero simile nisi nervis valvae tenuissimis vel 0. *Antherae* 2 mm. longae. *Spiculae pedicellatae* praeter summas sessilibus similes, sed gluma inferior magis convexa, integra, uno latere tantum alata vel cristata, superior e carina excentrica elongata

alata, alis vel potius cristis viridibus firmulis ; anthoecio infero neutro, supero ♂. *Spicula summa* glumarum cristis longe in caudas productis, crista inferioris leviter torta et ad 20 mm. longa.—*Rottboellia caudata*, Hack. Mon. Androp. p. 298.

Tropical Africa. From Sierra Leone to the Sudan and southwards to Angola.

The species was originally described from a specimen collected by Büchner at Malange, Angola. The only other species known so far to belong to *Chasmopodium* is *C. Afzelii*, Stapf, a grass confined to Sierra Leone and the lower Senegal, which is very closely allied to *C. caudatum*. The difference between *Chasmopodium* and *Rottboellia* (sens. angust.) is chiefly in the structure of the axes of the raceme and their adaptation to receive the fertile (sessile) spikelets. In *Rottboellia* each joint is fused with the adjoining pedicel, forming an anticously open receptacle in which the sessile spikelet is lodged. In *Chasmopodium*, on the other hand, joint and pedicel are clearly separate, leaving an oblong open space between them, within which the upper glume of the sessile spikelet is exposed.—O. Stapf.

Fig. 1, group of spikelets in front view ; 2, same in back view ; 3, lower glume ; 4, upper glume ; 5, lower floret ; 6, upper floret (3–6 of sessile spikelet) ; 7, lower glume of pedicelled spikelet ; 8, pedicelled spikelet with the crest continued into a caudate appendage. *All enlarged.*

O.S anal A.W.D. lith

Tabula 3083.

RHYTACHNE GRACILIS, *Stapf.*

Gramineae. Tribus Andropogoneae.

R. gracilis, *Stapf in Journ. de Bot.* 1905, p. 98 ; *et in Pobég. Ess. Fl. Guin. Franç.* (1906) p. 219 ; affinis *R. triaristatae,* Stapf, sed gracilior, spiculis multo minoribus, gluma inferiore minus alte tuberculata vel rugosa rarius plane laevi, pedicellis in setulam unicam abeuntibus.

Herba annua, glabra. *Culmi* solitarii vel fasciculati, graciles, ad 40 cm. alti, 2–3-nodes, basi magis minusve compressi et vagina brevi inclusi, internodiis superioribus longe exsertis. *Foliorum* vaginae laeves, inferiores magis minusve compressae, circiter 2·5 cm. longae ; ligulae breves, ovatae, subauriculatae, e dorso pilosulae ; laminae praeter summam setiformem brevem filiformes, arcte complicatae, 5–7·5 cm. longae, 1 mm. latae. *Racemi* solitarii, erecti, recti vel subflexuosi, ad 10 cm. longi ; articuli lineares, superne clavati cavique, 3 mm. longi, dorso rotundati, facie leviter concavi, subscaberuli, horizontaliter disarticulati, apice ciliolati ; pedicelli lineari-lanceolati, applanati, articulis contigui, vix nervosi. *Spiculae sessiles* e callo minuto annulari lanceolato-oblongae, 3 mm. longae, exaristatae, brunneo-rubescentes. *Gluma* inferior chartacea, acuta, infra medium transverse conspicue vel obscure rugulosa, rarius sublaevis, circiter 9-nervis, carinis superne rigide ciliolatis in setulas ad 4 mm. longas excurrentibus ; superior inferiorem aequans, lanceolata, subhyalina, 3-nervis, in setulam terminalem 3 mm. longam abiens. *Anthoecium inferum* ♂ : valva lanceolata, hyalina, 2 mm. longa, sub-2-nervis cum valvula breviore. *Anthoecium superum :* valva lanceolata, acuta, hyalina, 1·5 mm. longa, 1-nervis, cum valvula multo breviore. *Spiculae pedicellatae* ad setam 3 mm. longam redactae.—Stapf in Prain, Fl. Trop. Afr. vol. ix. p. 86.

Tropical Africa. French Guinea : Kouroussa, *Pobéguin,* 494 ; Timbo, *Pobéguin,* 1764, 1766, 1790b.

The standard specimen of *R. gracilis* consists of a bundle of closely packed, but separate simple culms ; in other cases the primary axis is branched from the very base, forming a tuft of erect culms, each of them flowering. The latter growth-form seems to be usual for the allied *R. triaristata,* Stapf (*Lepturopsis triaristata,* Steud.), which

is, however, a more robust plant and also differs in the possession of larger spikelets, with the lower glume very sharply wrinkled up to the broadly triangular more conspicuously ciliolate tip and with mostly 2-aristulate pedicels. I have followed K. Schumann in accepting Schweinfurth's No. 2485 (the original of Hackel's *R. triseta*) as identical with Steudel's *Lepturopsis triaristata*, but I have not seen the original of the latter and am somewhat doubtful as to the correctness of Schumann's interpretation. Hackel described *R. triseta* as perennial with extravaginal innovations. I have not been able to find such, or to see traces of a rhizome in the Kew specimen of Schweinfurth's plant, which is merely a densely tufted annual.

R. gracilis and *R. triaristata* are the only annual species of the genus, the others being typically caespitose perennials with closely packed, hard, long, persisting basal sheaths and wiry culms.—O. Stapf.

Fig. 1, a portion of a spike; 2, sessile spikelet with the lower glume removed and the glume-like pedicel on the left; 3, lower glume of sessile spikelet; 4, ♂ floret of sessile spikelet. *All enlarged.*

A W.D del et lith

O S.anal.

Tabula 3084.

MISCANTHIDIUM TERETIFOLIUM, *Stapf.*

Gramineae. Tribus Andropogoneae.

M. teretifolium, *Stapf in Prain, Fl. Trop. Afr.* vol. ix. p. 89; affinis *M. junceo,* Stapf (*Eriantho junceo,* Stapf), sed robustior, panicula majore argenteo-villosa, spiculis majoribus pilis albis superatis, glumis tenuioribus, arista longiore diversa.

Gramen perenne, 2–3 m. altum. *Culmi* erecti. *Folia* basalia dense congesta; vaginae arcte imbricatae, crassae, firmae, teretes, glaberrimae, laeves, albidae, infimae longe persistentes; ligulae late ovatae vel oblongae, 2–4 mm. longae, firme scariosae, in dorso pilosae; laminae calamiformes, basi subcanaliculatae, ultra 1 m. longae et ad 5 mm. crassae, albescentes, laevissimae, glabrae, nisi basi pone ligulam pilosae, in vaginae dorsum decurrentes. *Panicula* erecta, argenteo-villosa, circiter 60 cm. longa, ad 10 cm. lata; rhachis laevis, teres vel superne angulata; rami primarii ad 20 cm. longi, a basi laxe ramulosi, in racemos saepe perlongos graciles tenaces abeuntes; articuli filiformes, 3–6 mm. longi, sublaeves vel saepius scaberuli vel rigide pubescentes, pilis longioribus nonnullis interdum additis; pedicelli geminati, articulis similes, apice discoideo-incrassati, inaequales, unus articulum adjacentem aequans vel subaequans, alter dimidio brevior. *Spiculae* lanceolatae, albidae, 5–5·5 mm. longae, callo dense pilis 1 mm. longis subadpressis vel paulo patulis vestito. *Glumae* aequilongae, tenuiter membranaceae, dorso imprimis infra medium longe pilosae, pilis ad 6 mm. longis spiculam superantibus; inferior anguste oblonga, apice magis minusve 2-dentata, sub-2-carinata, nervis intra carinas plerumque 2, extra carinas utrinque 1; superior similis sed lanceolata, acuta, 3-nervis. *Anthoecium inferum* ad valvam vacuam hyalinam lineari-lanceolatam subacutam angustam 2-nervem ciliatam glumis paulo breviorem redactum. *Anthoecium superum* ♀: valva anguste lineari-lanceolata, hyalina, 2-loba, ad 2 mm. longa, lobis angustis ciliatis, arista tenui geniculata, columna 1 mm. longa, seta ad 7 mm. longa leviter torta; valvula minuta, elliptica, hyalina. *Antherae* atropurpureae, 3 mm. longae. *Stigmata* fere 3 mm. longa, atropurpurea.—*Erianthus teretifolius,* Stapf in Journ. Linn. Soc. vol. xxxvii. p. 478 (1906); Pilger in Engl. Jahrb. vol. xxxix. p. 597 (1907).

Tropical Africa. Angola; Malange District, *Gossweiler*, 807. Rhodesia: Livingstone, *Craster*, 33; islands in the Zambesi, near Victoria Falls, *Gibbs* (original); *Rogers*, 5315.

Five species referable to *Miscanthidium* have been described so far, *M. capense*, *M. Sorghum* and *M. junceum* under *Erianthus* (see Flora Capensis, vol. vi. p. 322), *M. teretifolium*, which may be accepted as the standard species or type, and *M. Gossweileri* under *Miscanthidium* (see Flora of Tropical Africa, vol. ix. part i. p. 89). *M. capense* and *M. Sorghum* have also been referred to *Saccharum* by Steudel, and the former to *Miscanthus* by Andersson, whilst *M. Gossweileri* was originally described by Hackel as a species of *Cleistachne*. In Hackel's Monograph of the Andropogoneae only *M. capense* and *M. Sorghum* are accounted for. There they form a small group of *Erianthus* characterised by the tough axes of the panicle and the presence of a "perfect" awn. Circumscribed as above, *Miscanthidium* agrees more closely with *Miscanthus* than *Erianthus*. Compared, however, with the East-Asiatic and Indo-Malayan *Miscanthi*, *Miscanthidium* stands out as an obviously distinct and homogeneous group of closely allied species confined to southern Tropical Africa, South Africa, and Madagascar, the most conspicuous character being the more branched thyrsiform and not corymbiform or flabelliform panicle. Two of the *Miscanthidia* have leaves with normally developed blades. In the remaining species they are reduced to their midribs, assuming the shape of rigid solid quills, sometimes of very great length.

In the absence of a basal leaf-tuft suitable for figuring, one of *M. junceum*, Stapf, from Rhodesia, has been selected to represent the arrangement and structure of the basal leaves, which are very similar in both species.—O. Stapf.

Fig. 1, pair of spikelets; 2, part of raceme, showing joints and pedicels after the fall of the spikelets; 3, lower glume; 4, upper glume; 5, valve of lower floret; 6, valve of fertile floret; 7, young flower with the valvule in front of the ovary. *All enlarged.*

Tabula 3085.

CAPILLIPEDIUM GLAUCOPSIS, *Stapf.*

Gramineae. Tribus Andropogoneae.

C. glaucopsis, *Stapf* (*comb. nov.*); affinis *C. parvifloro*, Stapf, sed differt glaucescentia, habitu suffruticoso fastigiatim interdum prolifere ramoso, foliorum laminis potius lineari-lanceolatis quam linearibus, spiculis saepissime pallidis apice rubescentibus, gluma exteriore spicularum sessilium in dorso subconvexa vel levissime depressa laevi.

Gramen suffruticosum, 1·2–2·5 m. altum, fastigiatim saepe bambusearum quarundam more prolifere ramosum. *Rhizoma* elongatum, repens, rarius abbreviatum, gemmis innovationum extravaginalium breviter conicis arcte squamis coriaceis tectis. *Culmi* primarii basi ad 6 mm. diametro, saepius vero uti secundarii multo graciliores, ramis ulterioribus gracillimis, omnes laevissimi, solidi. *Foliorum* vaginae primo arctae, deinde ramis evolutis solutae, firmae, teretes, glabrae vel ad nodos et ad ora barbatae; ligulae breves, scariosae; laminae e basi attenuata anguste lineari-lanceolatae, apice longo setaceo, 12-30 cm. longae, 5–8 mm. latae, fasciculorum proliferorum saepe multo tenuiores, glabrae vel infra interdum pubescentes pilis tenuibus longis intermixtis, supra scabridae, margine aspero, costa tenui albida. *Panicula* erecta, decomposita, laxa vel tandem laxissima, 5–15 cm. longa, 3–7 cm. lata; rami primarii hincinde solitarii, plerumque plures pseudoverticillati, inaequales, tenuissime filiformes, 2–4 (rarius 6) cm. longi, obliqui vel demum divaricati, fere a basi laxe divisi, uti ramuli ad axillas pulvinatim incrassati et pilosi. *Racemi* plerumque 2-articulati (spiculis 5) vel 3-(raro 1-)articulati; articuli pedicellique circiter 1·5–2 mm. longi, applanati (praesertim pedicelli) et inter margines incrassatos pellucidi, utrinque albo-ciliati, ciliis plurimis elongatis. *Spiculae sessiles* oblongae, subacutae, 2·2–4 mm. longae, pallidae, sursum rubescentes, basi e callo barbulatae. *Glumae* membranaceae; inferior minute truncatula, in dorso subconvexa vel levissime depressa, laevis vel laevissima et fere nitidula, nervis inter carinas rigide albo-ciliatas circiter 4, apicem versus distinctis vel omnino obscuris; superior acuta, superne carinata, 3-nervis. *Anthoecium inferum* ad valvam hyalinam elliptico-ovatam enervem apice parce ciliatam glumas medias aequantem vel eis breviorem redactum. *Anthoecium superum*: valva stipitiformis, in aristam pergracilem

medio geniculatam abiens, eacum 8–12 (rarius 15) mm. longa. *Spiculae pedicellatae* lanceolatae, quam sessiles plerumque plane longiores (ad 4 mm.), acutae vel acute acuminatae, pallide rubescentes vel fuscescentes. *Glumae* tenuiter membranaceae; inferior distincte 9–11-nervis, ad carinas superne ciliata; superior similis, sed 3-nervis, saepe brevior. *Anthoecium inferum* ad valvam hyalinam obovato-ellipticam enervem apice ciliolatam glumam superiorem aequantem redactum. *Anthoecium superum* ad florem ♂ (raro hebetatum) redactum. *Antherae* ad 1·5 mm. longae. *Caryopsis* lineari-oblonga, 1 mm. paulo longior.—*Andropogon glaucopsis*, Steud. Syn. Pl. Glum. vol. i. p. 397. *A. subrepens*, Steud. l.c. *A. montanus*, Hack. Mon. Androp. p. 491; Lisboa in Journ. Bomb. Nat. Hist. Soc. vol. vi. (1891), p. 203, non Roxb. *A. assimilis*, Hook. f. Fl. Brit. Ind. vol. vii. p. 179; Cooke, Fl. Bomb. vol. iii. p. 982, vix Steud. *Rhaphis glauca* et *R. repens*, Nees ms. ex Steud. l.c.

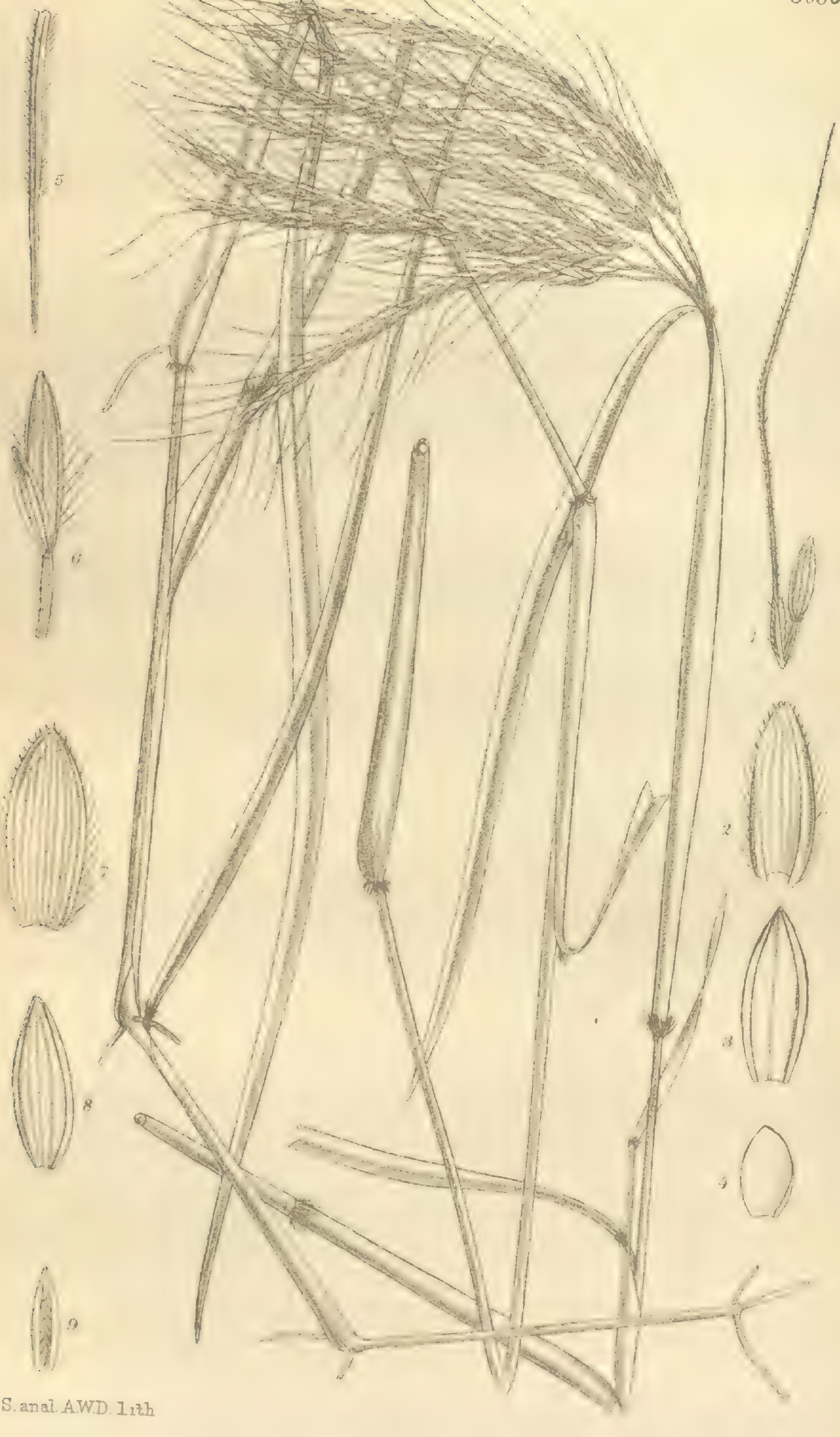
India, China, and Java. In India, from the lower Himalayas to 16 N. lat. in the Deccan Peninsula, and eastwards through the Khasia Hills to Lower and Central Burma, thence to Siam, Tonking, Yunnan, Kwangtung, and the Yangtse Kiang valley: also in Java. In dry, open situations and in deciduous forest and sunny jungle, locally abundant, often imitating small bamboos.

J. D. Hooker, l.c. 177, has already pointed out that Bentham and Hackel were mistaken in their conception of *Andropogon montanus*, Roxb., and he placed the latter correctly near *A. intermedius*, R.Br., and *A. odoratus*, Lisb. (*Amphilophis intermedia*, Stapf, and *A. odorata*, Stapf). Hance's specimen, quoted by Bentham from Hongkong under *A. montanus*, is a somewhat robust state of the spicigerous form of *Capillipedium parviflorum*, Stapf (*A. micranthus*, var. *spicigerus*, Hack.), whilst the synonyms quoted by him represent partly typical *C. parviflorum* (*A. villosulus* and *A. parvispicus*, Steud.) and partly *Amphilophis glabra*, Stapf (*Rhaphis stricta*, Nees), and the description may be taken also to cover to some extent the plant figured here. Hackel distinguishes two varieties of his "*Andropogon montanus*"—one with green blades and sparingly and shortly ciliate joints and pedicels (his *α genuinus*), and another with glaucescent blades and more copious and longer ciliae (his *β glaucopsis*). To the variety *α* he refers *Chrysopogon pictus*, Hance, and *Andropogon assimilis*, Steud. *A. pictus* was described from a specimen collected at Fokien. This is typical *C. parviflorum*. *A. assimilis* is known to me only from Steudel's somewhat confused description, which points rather to *C. parviflorum*. Of the Indian specimens quoted by him under *α*, Wallich 8806 in Wallich's own Herbarium is *Amphilophis glabra*, Stapf, whilst the remainder, so far as the corresponding specimens in the Kew Herbarium go, are to me indistinguishable from his var. *β glaucopsis*, and they tally very well with the specimens quoted under it, except as regards Wallich 8789, which, in Wallich's own Herbarium, is *Garnotia stricta*, Brongn.

Two of those specimens, namely, Wallich 8786 and 8787, are the originals of Steudel's *A. glaucopsis*. These are in excellent condition, and represent unmistakably the plant described and figured here. I have therefore preferred the epithet *glaucopsis* to that of *assimilis* in forming the new combination under *Capillipedium*. It is moreover quite descriptive as compared with the meaningless *assimilis*.

The genus *Capillipedium* corresponds to the *Capillipedes* of Hackel's subgenus *Amphilophis*. Its affinity with the bulk of the remainder of *Amphilophis* is quite evident, particularly through certain Australian specimens of *C. parviflorum* and *A. intermedia*, but taken as a whole it stands out as a natural and easily recognised group. Two of its species are of wide distribution, namely, *C. glaucopsis* and *C. parviflorum*. The latter, which extends from North-West India to Japan, Australia and Polynesia, and westwards to Abyssinia, is the only one with a distinct tendency to marked racial differentiation, particularly in the eastern section of its area. The other species referable to *Capillipedium* are *C. Schmidii* (*Andropogon Schmidii*, Hook. f.), *C. pteropechys* (*A. pteropechys*, C. B. Cl.), *C. Hugelii* (*A. Hugelii*, Hack.), *C. filiculme* (*A. filiculmis*, Hook. f.), and possibly one or two other as yet imperfectly known species. All these are confined to the Deccan and Rajputana.—O. Stapf.

Fig. 1, raceme, back view; 2, same, front view; 3, lower glume; 4, upper glume; 5, valve of lower floret; 6, valve of upper floret with awn (3–6 of sessile spikelet); 7, lower glume of pedicelled spikelet; 8, upper glume of same (middle nerve omitted). *All enlarged.*



O.S. anal. A.W.D. lith

Tabula 3086.

EUCLASTA CONDYLOTRICHA, *Stapf.*

Gramineae. Tribus Andropogoneae.

E. condylotricha, *Stapf in Prain, Fl. Trop. Afr.* vol. ix. p. 181; species generis unica.

Gramen annuum. *Culmi* ultra 1·5 m. alti, plerumque geniculatim ascendentes et saepe e nodis infimis radicantibus, rarius erecti, graciles, teretes, laeves, pro more ramosi. *Foliorum* vaginae teretes, arcte vel leviter inflatae, striatae, glabrae vel parce ad margines et os versus hirsutae, raro ubique molliter pilosae, semper ad nodos barbatae; ligulae membranaceae, ciliatae, breves; laminae lineares, longe in apicem setaceum attenuatae, basi magis minusve contractae, ad 30 cm. longae, 5–8 (raro 10) mm. latae, subflaccidae, virides, plerumque (saltem infra, haud supra nisi parcissime) pilis e tuberculis minutis ortis tenuibus mollibus pilosae, raro glabrae, secundum margines scabridae, costa pertenui albida. *Paniculae* subdigitatae, terminales in culmis primariis et eorum ramis intermediis et superioribus, haece saepe depauperatae; axis primarius filiformis, ad 12 cm. longus; rami simplices vel infimi parce divisi, subcapillares, ad 12 mm. longi (racemis demptis), flexuosi, glabri, ad nodos eximie barbati, pilis ad 4 mm. longis. *Racemi* pauci vel plures (ad 15), flexuosi, plerumque penduli, 2·5–5 cm. longi, demum basin versus disarticulati spiculis sterilibus solis persistentibus; articuli pedicellique partis fertilis simillimi, 2 mm. longi, dense breviter ciliati, inter margines incrassatos pellucidi, ibi balsamiferi et tandem nigricantes. *Spiculae sessiles fertiles* oblongae, pallidae, 4 mm. longae, e callo minute barbatae. *Glumae* aequales; inferior minute truncata, basin versus et ad latera magis minusve pilosa; nervi 4–5 inter carinas, infra apicem hyalinum desinentes; superior navicularis, subacuta. *Anthoecium inferum* ad valvam hyalinam 1·5 mm. longam redactum. *Anthoecium superum* ♀: valva stipitiformis, in aristam geniculatam 2·5–3·7 cm. longam abiens; valvula 0. *Antherae* 0·4–1·5 mm. longae. *Caryopsis* obovoideo-oblonga, a dorso compressa, vix 2 mm. longa. *Spiculae sessiles steriles* (infimae) *et pedicellatae* fertilibus forma similes nisi paulo majores (5–6 mm. longae). *Gluma inferior* magis minusve pilosa, 10–17-nervis; superior brevior, 3–5-nervis. *Valvae* oblongae vel lineares, hyalinae, varie redactae vel una plane suppressa. *Antherae*

ad 2 mm. longae.—*E. glumacea*, Franch. in Bull. Soc. Hist. Nat. Autun, vol. viii. p. 335. *E. graminea*, Th. & Hél. Durand, Syll. Fl. Congol. p. 649. *Andropogon condylotrichus*, Hochst. in Steud. Syn. Pl. Glum. vol. i. p. 377 ; Hack. Mon. Androp. p. 650. *A. piptatherus*, Hack. in Mart. et Eichl. Fl. Bras. vol. ii. pars iii. p. 293, et in Mon. Androp. p. 579. *Sorghum piptatherum*, O. Kuntze, Rev. Gen. Pl. p. 792. *Amphilophis piptatherus*, Nash in North Amer. Fl. vol. xvii. p. 127.—O. Stapf.

Tropical Africa and America. In Africa, from Upper Guinea to Angola, Lake Tanganyika and Zanzibar ; in America, from Mexico to Brazil.

Fig. 1, pair of spikelets ; 2, lower glume ; 3, upper glume ; 4, valve of lower floret ; 5, valve of upper floret with base of awn (2–5 of sessile floret) ; 6, pedicel with spikelet ; 7, lower glume ; 8, upper glume ; 9, valve (6–9 of pedicelled spikelet). *All enlarged.*

E.M.J. anal. A.W.D. 11th.

Tabula 3087.

SCHIZACHYRIUM URSULUS, *Stapf.*

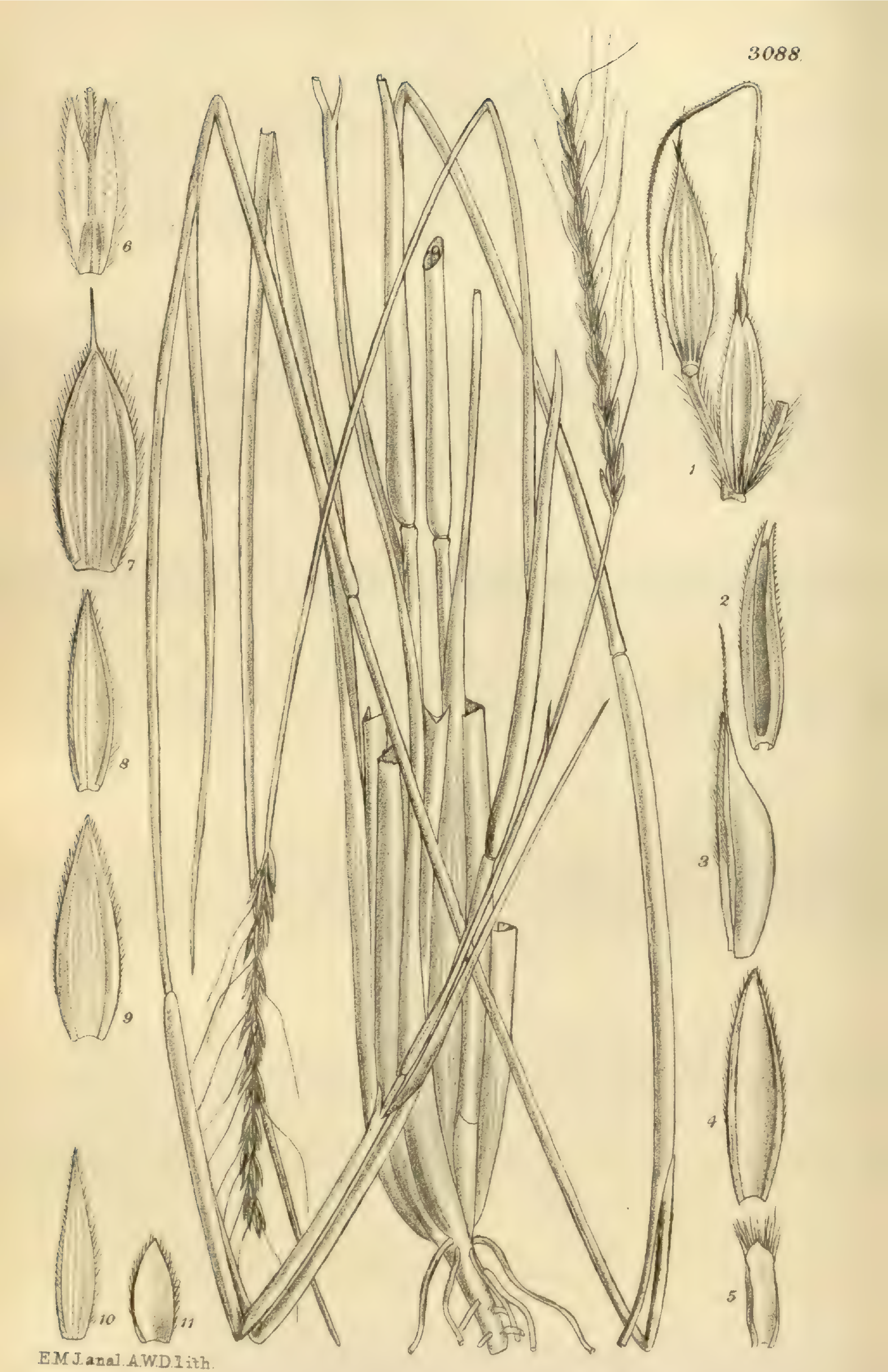
GRAMINEAE. Tribus ANDROPOGONEAE.

S. ursulus, *Stapf in Prain, Fl. Trop. Afr.* vol. ix. p. 197; affine *S. Jeffreysii*, Stapf, sed hirsutie, spiculis minoribus et valvis fertilibus multo altius divisis distinctum.

Gramen perenne, compacte caespitosum. *Culmi* erecti vel breviter ascendentes, duri, 5- vel plurinodes, e nodis inferioribus fastigiatim ramosi; rami solitarii, omnes florentes, nodis ad 5. *Folia* ubique magis minusve hirsuta vel villosa indumento griseo vel fulvo demum partim evanescente; vaginae inferiores admodum compressae, diu persistentes, superiores teretes; ligulae brevissimae, truncatae; laminae anguste lineares, acutae, plerumque plicatae, flexuosae, ad 22 cm. longae, ad 2 mm. latae (explicatae), costa tenui. *Spatheolae* angustissimae, laminis rudimentariis setaceis vel mucroniformibus. *Racemi* pedunculis sursum leviter incrassatis in spathis inclusis vel breviter exsertis 4–6 cm. longis suffulti, ubique fulvo-villosi, subflexuosi, 3–5 cm. longi; articuli rhachis filiformes, superne incrassati appendice cupulari subdentato, in dorso et ad latera dense pilosi, pilis sursum longioribus, 4–5 mm. longi; pedicelli articulis similes, sed paulo breviores. *Spiculae sessiles* anguste lineari-lanceolatae, acuminatae, 7 mm. longae, callo breviter barbato incluso. *Glumae* subaequales: inferior 2-dentata, tenuiter chartacea, dorso applanata, ubique fulvo-villosa, marginibus arcte inflexis angustis, nervis circiter 6 subobscuris inter carinas; superior anguste lanceolata, acuminata, pubescens, ciliolata, delicate 3-nervis. *Anthoecium inferum* ad valvam hyalinam oblongam 6 mm. longam 2-nervem purpurascentem redactum. *Anthoecium superum* ♀: valva lineari-oblonga, ad medium 2-fida, hyalina, ciliolata, lobis linearibus acutis; arista ex eorum sinu orta gracilis, 12–14 mm. longa, infra medium geniculata, torta, brunnea; valvula 0. *Antherae* 3 mm. longae. *Spiculae pedicellatae* ♂ anguste lanceolatae, aristulatae. *Gluma* inferior 4–5 mm. longa, aristula gracillima recta fere aequilonga terminata, fulvo-villosa, 7-nervis; superior lineari-oblonga, acute acuminata, hyalina, 3-nervis. *Valvae* oblongae, ciliolatae; inferior ad 5 mm. longa 2-nervis; superior brevior, 3-nervis.—O. STAPF.

TROPICAL AFRICA. Angola: Benguella, country of the Ganguellas and Ambuellas, *Gossweiler*, 2988.

FIG. 1, pair of spikelets; 2, lower glume; 3, upper glume; 4, valve of lower floret; 5, valve of upper floret with base of awn (2–5 of sessile spikelet); 6, lower glume; 7, upper glume; 8, valve of lower floret; 9, valve of upper floret (6–9 of pedicelled spikelet). ***All enlarged.***



E.M.J. anal. A.W.D. lith.

Tabula 3088.

ANDROPOGON TEXTILIS, *Rendle.*

Gramineae. Tribus Andropogoneae.

A. (§ **Piestium**) **textilis,** *Rendle in Cat. Afr. Pl. Welw.* vol. ii. p. 144; ab altera specie huius sectionis monobotrya (*A. Macleodiae,* Stapf) differt spiculis majoribus, gluma superiore aristulata, culmo parce ramoso, foliorum laminis arcte plicatis alte carinatis, inter species polybotryas *A. Dummeri,* Stapf, proximus.

Gramen perenne, compacte caespitosum, ad 1 m. altum, innovationibus intravaginalibus numerosis. *Culmi* erecti, simplices vel superne hincinde ramosi, graciles, teretes, 4–5-nodes, glabri, sursum scaberuli vel puberuli. *Foliorum* vaginae arctae, infimae a latere compressae, carinatae, firmae, diu persistentes, caeterae teretes, omnes laeves; ligulae acute lanceolatae, 5–10 mm. longae, scariosae, glabrae; laminae anguste lineares vel junciformes, a latere compressae, arcte plicatae vel basi canaliculatae, longe in apicem tenuem attenuatae, basales ultra 30 cm. longae, 0·6–1·5 mm. latae, dorso glabrae, facie scaberulae vel puberulae, marginibus scaberulae, costa lateraliter compressa inferne carinata. *Racemi* solitarii, terminales in quoque culmo vel cum 1–3 additis in ramis distantibus longissimis 1-nodis, hi basi foliis normalibus suffulti. *Spatheolae* anguste lanceolatae, in apicem setaceum attenuatae, 5–10 cm. longae, subherbaceae, glabrae, tandem arcte involutae; pedunculi filiformes, 15–22·5 cm. longi, apice scaberuli vel puberuli. *Racemi* recti vel flexuosi, densi, 3·5–6·5 cm. longi, virescentes, parce villosi; articuli subclavati, 3–4 mm. longi, flavidi, nitidi, dorso glabri, ad margines dense ciliati ciliis albis vel flavescentibus ad 4 mm. longis; pedicelli similes. *Spiculae sessiles* inter articulos et pedicellos adjacentes arcte retentae, a dorso lineares, callo minuto breviter barbato incluso 5–6 mm. longae, flavidae, sursum virentes. *Glumae* aequales; inferior basi et ad latera rotundata, chartacea, medium versus et apice membranacea, 2-mucronata vel 2-aristulata, fere tota longitudine alte sulcata, dorso in sulco dense pubescens, facie ad apicem et ad latera puberula, supra medium 2-carinata, carinis scabridis, nervis inter eas 6 iis proximis; superior navicularis, emarginata, e sinu aristulam 4 mm. longam edens, membranacea, ciliata, 3-nervis. *Anthoecium inferum* ad valvam linearibranacea, ciliata, 3-nervis. *Anthoecium inferum* ad valvam lineari-oblongam 5 mm. longam hyalinam ciliatam 2-nervem redactum.

Anthoecium superum ♀: valva late oblonga, fere ad medium bifida, 5 mm. longa, hyalina, ciliata, 3-nervis, lobis ovato-lanceolatis acutis; arista gracilis, 18–20 mm. longa, ad vel infra medium geniculata, columna minute puberula fusca; valvula lineari-oblonga, hyalina, 3 mm. longa, sub-2-nervis vel enervis, ciliata. *Antherae* 4 mm. longae. *Caryopsis* oblonga, 2 mm. longa, subteres. *Spiculae pedicellatae* ♂, late oblongo-lanceolatae, subacuminatae, interdum purpurascentes, 5–6 mm. longae; glumae subaequales, inferior aristulata, 13-nervis, carinis acutis rigide ciliolatis; aristula ad 4 mm. longa; superior submembranacea, lanceolata, acuta, 5-nervis, ciliata; valvae lineari-oblongae, acutae, 3-nerves, superior ♂ cum valvula ei spiculae sessilis simili.—O. Stapf.

Tropical Africa. Angola: Pungo Andongo, *Welwitsch*, 7440; Benguella, *Gossweiler*, 2415.

Fig. 1, pair of spikelets; 2, lower glume; 3, upper glume; 4, valve of lower floret; 5, valvule of upper floret; 6, valve of same (2–6 of sessile spikelet); 7, lower glume; 8, upper glume; 9, valve of lower floret; 10, valve of upper floret; 11, valvule of upper floret. *All enlarged.*

M S anal. AWD Lith

Tabula 3089.

EXOTHECA ABYSSINICA, *Anderss.*

Gramineae. Tribus Andropogoneae.

E. abyssinica, *Anderss. in Nov. Act. R. Soc. Sc. Ups.* ser. 3, vol. ii. p. 253, tab. 3; species generis unica.

Gramen dense caespitosum, ad fere 1 m. altum. *Culmi* erecti, graciliores, 2–3-nodes, infra ramos florentes simplices, praeter internodia infima teretes. *Foliorum* vaginae teretes vel innovationum compressae, ore in auriculas angustas acutas firmas productae; ligulae scariosae, truncatae, glabrae, auriculis adnatae; laminae e basi attenuata anguste lineares, in apicem tenuem longum productae, ad 30 (rarius 45) cm. longae, 2–4 mm. latae, plicatae vel superiores planae, firmae, pallido- vel glauco-virides, plerumque glabrae, praesertim basin versus, ad margines et in facie superne scabridae. *Inflorescentia* ramis paucis distantibus simplicibus solitariis (rarissime e basi cincinnatim divisis vel fasciculatis) longis gracilibus pare racemorum unico terminatis constituta, raro ad racemorum par unicum redacta. *Spatheolae* angustae, acutae vel tenuiter acuminatae, 7·5–12·5 cm. longae, subherbaceae, mox arcte involutae; pedunculi stricti, tandem longe exserti. *Racemi* 2·5 cm. longi, ei uniuscuiusque paris internodio glabro scaberulo 12–25 cm. longo separati, virescentes, purpureo- vel violaceo-tincti, ex involucro parium 2 homogamorum spicularum ♂ persistentium et trione spicularum heterogamarum deciduo constituti, axis inter paria homogama haud nisi tarde, supra ea faciliter disarticulatus; articuli pedicellique involucri brevissimi, glabri; pedicelli trionis graciles dense rufo-ciliati, 7 mm. longi. *Spiculae* omnes glaberrimae; *fertilis* ♀ ambitu linearis, callo incluso ad 14 mm. longa, in dorso convexa, ad latera rotundata, pallida vel virescens, tandem teres et castaneo-brunnea; callus gracilis, 4 mm. longus, pungens, dense fulvo- vel rufo-barbatus. *Glumae* subaequales; inferior subcoriacea, tandem indurata et coriacea, in rostrum breve 2-dentatum 2-carinatum membranaceum producta marginibus infra involutis, dorso basi pubescens, sursum glabrescens, nervis 9 quorum 3 inter carinas rostri prominuli et asperuli; superior tenuior, apice tenuiter carinata, 3-nervis. *Anthoecium inferum* ad valvam oblongam obtusam hyalinam 2–3-nervem 12–14 mm. longam redactum. *Anthoecium superum* ♀: valva stipitiformis, lineari-oblonga, basi hyalina, superne cartilaginea,

breviter 2-loba; arista valida, 4–10 cm. longa, columna quam seta longior, fulvo-hirtella; valvula hyalina, obovata, longe ciliata, ultra 2 mm. longa. *Antherae* 4 mm. longae. *Spiculae* ♂ (involucri et trionis) lineari- vel lanceolato-oblongae, 14–16 mm. longae. *Gluma inferior* a dorso valde compressa, acuta, mutica (involucri) vel mucronata vel aristulata, 11- (involucri) vel 15-nervis, utrinque anguste alata (involucri) vel uno latere cum nervo marginali, altero cum ala angusta, alis involutis; *superior* brevior, lanceolata, acuta, 3-nervis, ciliata; valvae hyalinae, ciliatae, inferior oblonga, 10–11 mm. longa, 3-nervis, superior lineari-oblonga, brevior, 1-nervis. *Antherae* 6–7 mm. longae.—Stapf in Prain, Fl. Trop. Afr. vol. ix. p. 385. *Anthistiria abyssinica*, Hochst. ex A. Rich. Tent. Fl. Abyss. vol. ii. p. 449. *Andropogon exothecus*, Hack. Mon. Androp. p. 632.

Tropical Africa. From Eritrea and Abyssinia through the highlands of East Africa to Lake Tanganyika, mostly between 1800 and 4300 m.

A highly specialised type, with suggestions of *Themeda*, but, by the structure of the fertile floret, the paired racemes and general facies, rather a member of *Hyparrheniastrae*.—O. Stapf.

Fig. 1, trio of spikelets; 2, lower glume; 3, upper glume; 4, valve of lower floret; 5, valve of upper floret with base of awn; 6, valvule of same (2–6 of sessile spikelet); 7, lower glume; 8, upper glume; 9, valve of lower floret; 10, valve of upper floret (7–10 of pedicelled spikelet); 11, upper glume; 12, lower glume (of involucral spikelet). *All enlarged.*

MS del AWD lith

O S anal

Tabula 3090.

ANADELPHIA ARRECTA, *Stapf.*

Gramineae. Tribus Andropogoneae.

A. arrecta, *Stapf in Prain, Fl. Trop. Afr.* vol. ix. p. 396; affinis *A. Afzelianae,* Stapf, sed glabra vel parce pilosa, valva aristata 2-dentata vel breviter 2-loba.

Gramen perenne, interdum ultra 3 m. altum. *Culmi* simplices, erecti, glabri, plerumque ad nodos pruinosi vel tenuiter pubescentes. *Foliorum* vaginae arctae, glabrae vel superne pilosae et saepe basi tenuiter pubescentes; ligulae brevissimae, ciliolatae, ad vaginam decurrentes; laminae anguste lineares, longe in apicem setaceum attenuatae, firmulae, ad 25 cm. longae, 4 mm. latae, laxe hirsutae, praesertim basin versus, ad margines scaberulae, costa supra pro rata latiuscula. *Panicula* spatheata, erecta, magis minusve contracta, interdum ultra 45 cm. longa, laxe divisa; internodia primaria 6–10, infima ad 12 cm. longa, superiora cito decrescentia et plerumque scaberula vel minute pubescentia; ramus infimus saepe ad 30 cm. longus, basi indivisus, rami cincinnorum primariorum (fasciculorum) 2–4-ni, valde inaequales saepe iterum eodem more divisi; ramuli ultimati ordinis tenuiter filiformes, infra apices unilateraliter barbulatos leviter incrassati et scaberuli, cincinnorum inferiorum ad 5 cm. longi, summorum multo breviores. *Spatheolae* lineari-lanceolatae, acutae, 2·5 cm. longae, subherbaceae, viridi-brunnescentes vel purpureo-glaucescentes, glabrae vel parce pilosae; pedunculi superne dense puberuli, in spatheolis inclusi, tandem 5–8 mm. longi. *Racemi* 14–18 mm. longi, e 2 spiculis sessilibus et 3 pedicillatis constituti; articuli pedicellique filiformes, utrinque breviter ciliati, 4–5 mm. longi. *Spiculae sessiles* lineari-oblongae, 5–6 mm. longae callo incluso, glabrae, pallide vel castaneo-brunneae et infra medium nitidulae, sursum virescentes; callus subpungens, 1·5–2 mm. longus, dense sericeo-barbatus. *Glumae* aequales; inferior coriacea, lineari-oblonga, truncata, ad latera alte rotundata, deinde carinatula, tenuiter 6–7-nervis; superior lineari-oblonga, obtusa vel subemarginata, aristula inclusa 12–14 mm. longa, 3-nervis, tenuiter ciliata. *Anthoecium inferum* ad valvam oblongam hyalinam 2-nervem ciliatam glumas aequantem redactum. *Anthoecium superum* ♀: valva linearis, oblongo-cuneata, breviter 2-loba, vix 4 mm. longa,

glabra; arista pro rata robusta, 2·5–3·7 cm. longa, medio geniculata, columna nigro-brunnea; valvula 0. *Antherae* 2–2·5 mm. longae. *Spiculae pedicellatae* ♂ vel neutrae, angustissime lineari-lanceolatae, longe acuminatae, 8–12 mm. longae, glabrae. *Glumae* subaequales, tenues, mucronatae vel breviter aristulatae, inferior 7–9-nervis, superior 3–5-nervis. *Valvae* lineari-oblongae, acutae, ciliatae, inferior 3-, superior 1-nervis vel 0.—*Andropogon arrectus*, Stapf in Journ. de Bot. vol. xix. (1905) p. 101, et in Pobég. Ess. Fl. Guin. Franç. p. 217; Cheval. Sudania, vol. ii. p. 130, et Expl. Bot. Afr. Occ. Franç. vol. i. p. 716. *A. trepidarius*, Pobég. l.c., non Stapf. *A. glauco-purpureus*, Stapf in Journ. de Bot. l.c. p. 102.

Tropical Africa. From French Guinea to the Lower Congo.—O. Stapf.

Fig. 1, raceme with the awn of the upper fertile spikelet cut (drawn too stout; the apparent pubescence of the fertile spikelets is meant to indicate the ciliae of the pedicels and joints behind them); 2, lower glume; 3, upper glume; 4, valve of lower floret; 5, valve of upper floret (2–5 of sessile spikelet); 6, lower glume; 7, upper glume; 8, valve of lower floret (6–8 of pedicelled spikelet). *All enlarged.*

M.S. del. A.W.D. Lith.

D.K.H. Anal.

Tabula 3091.

MONIUM MACROCHAETUM, *Stapf.*

GRAMINEAE. Tribus ANDROPOGONEAE.

M. macrochaetum, *Stapf in Prain, Fl. Trop. Afr.* vol. ix. p. 400; species generis unica.

Gramen annuum, tenue, ad 30 cm. vel ultra altum. *Culmi* erecti, gracillimi, simplices, 2–4-nodes, saepe a nodo infimo radicantes, teretes, glabri. *Foliorum* vaginae teretes, arctae, glabrae, tenues, infimae marcescentes; ligulae brevissimae, rotundatae vel truncatae, ciliolatae; laminae angustissime lineares, in apicem tenuem attenuatae, 2·5–5 cm. longae, 0·5–1 mm. latae, primo plicatae, demum planae, glabrae vel tenuissime pubescentes et marginibus subscaberulis, costa pertenui. *Panicula* spatheata, contracta, angusta, ad 15 cm. longa; internodia primaria ad 4, infimum ad 7·5 cm. longum, plerumque vero multo brevius; rami primarii cincinnatim divisi, (fasciculati), cincinni radiis ad 4, uno saepe iterum diviso vel omnibus simplicibus gracillimis angulatis superne scaberulis, raro ramis infimis basi indivisis, ad 25 cm. longis. *Spatheolae* angustissimae, mox arcte involutae, longe tenuiter acuminatae, 1·8–2·2 cm. longae, scariosae, pallidae vel purpurascentes, glabrae; pedunculus in spatheola inclusus, gracillimus, scaberulus, superne leviter incrassatus apice peroblique truncato. *Spiculae* omnes aequales, solitariae, ♀, subteretes, circiter 6 mm. longae, castaneae, callo acuto rufo-barbato 1·75 mm. longo. *Glumae* aequales, coriaceae vel subcoriaceae, dorso rotundatae marginibus involutis minute pubescentes, mox glabratae et basin versus nitidae; inferior 2-dentata, apice obscure 2-carinata, obscure 6–7-nervis; superior sub-8-nervis, ex apice emarginato aristulata; aristula tenui 2 mm. longa. *Anthoecium inferum* ad valvam hyalinam obscure ciliolatam 2–3 mm. longam redactum. *Anthoecium superum* ♀: valva anguste oblonga, quarta parte 2-fida, basi et marginibus et lobis subulatis hyalinis, 3–3·5 mm. longa, eciliolata; arista gracilis, 4–5 cm. longa, supra medium recto angulo geniculata, columna stricta laxe torta glabra atrofusca. *Antherae* ultra 2 mm. longae. *Caryopsis* cylindrica, gracillima, 2 mm. longa.

TROPICAL AFRICA. French Guinea; near Timbo, *Pobéguin,* 1790.

The reduction of the raceme, already so marked in *Anadelphia,* is carried to an extreme in *Monium,* nothing being left of the raceme but one sessile bisexual spikelet. In this respect it stands in the same relation to *Anadelphia* as *Cleistachne* does to *Sorghum.*—O. STAPF.

FIG. 1, two-rayed tier of inflorescence; 2, spikelet opened out, with base of awn; 3, valve of upper floret. *All enlarged.*

AWD del et. lith.

M.S. anal.

Tabula 3092.

ELYMANDRA ANDROPHILA, *Stapf.*

Gramineae. Tribus Andropogoneae.

E. androphila, *Stapf in Prain, Fl. Trop. Afr.* vol. ix. p. 408; species generis unica.

Gramen annuum, robustum, ad 3 m. altum vel ultra. *Culmi* teretes, glabri. *Folia* (superiora) praeter barbas pilorum longorum ad vaginarum ora ortas glaberrima; vaginae teretes, glabrae, laeves, internodiis breviores; ligulae membranaceae, truncatae, 1 mm. longae; laminae anguste lineares, sursum longe in apicem tenuem attenuatae, ad 60 cm. longae, 4 mm. latae, planae vel marginibus scabris revolutis, glaucescentes, costa facie albida et basin versus dilatata. *Panicula* spatheata, laxissima, ad 60 cm. longa, ramis 4–5 valde remotis, infimis ultra 30 cm. longis supra nodum secundum cincinnatim divisis, caeteris cincinnatim 4–5-nis, uno iterum diviso et saepe ad 24 cm. longo, ramulis ultimis filiformibus 7·5–10 cm. longis. *Spatheolae* angustae, longe in apicem setaceum attenuatae vel laminam subuliformem gerentes, 7·5–10 cm. longae, herbaceae, tandem arcte involutae; pedunculi filiformes, ex apice vel pone eum exserti, superne scaberuli. *Racemi* 2-nati, internodio 16–20 mm. longo separati, 2–3·5 cm. longi, virescentes, e trione terminali spiculam sessilem ♀ continente et paribus 5–6 homogamis plerumque ♂ laxe dispositis constituti; rhachis inter paria homogama subtenax, ad nodos ciliolata, caeterum glabra, supra ea facile disarticulata; articuli linearifiliformes, 1·5–3 mm. longi; pedicelli parium homogamorum glabri, 3–4 mm. longi, trionis 8–10 mm. longi, utrinque dense ciliati. *Spicula* ♀ oblonga, subteres, callo acuto 1·5–2 mm. longo dense barbulato incluso 11 mm. longa, atro-violacea vel tandem fere nigra, laxe tenuiter pubescens. *Glumae* subaequales, coriaceae; inferior obtusa vel truncata, ecarinata, 7-nervis, nervis plane obscuris nisi a facie visis; superior acuta, in dorso utrinque sulcata, 3-nervis. *Anthoecium inferum* ad valvam oblongam obtusam hyalinam reverse ciliolatam redactum. *Anthoecium superum*: valva stipitiformis, minute dentata, 3 mm. longa, glabra; arista robusta, ad 7·5 cm. longa vel longior, medio geniculata, columna fulvo-hispidula. *Spiculae* parium homogamorum et pedicellatae trionis simillimae, ♂, raro neutrae, lanceolatae, acuminatae, 7–9 mm. longae, glabrae. *Gluma* inferior herbaceo-chartacea, acuta vel acuminata, saepe mucronata vel aristulata,

multinervis, ecarinata, ad latera anguste involuta; superior subhyalina, 3-nervis. *Valva* inferior gluma superiore brevior, hyalina, reverse ciliolata, 1-nervis; superior angustissima vel 0. *Antherae* 4 mm. longae, purpureae.—*Andropogon androphilus*, Stapf in Journ. de Bot. vol. xix. p. 103; Cheval. Explor. Bot. Afr. Occ. Franç. vol. i. p. 715; Pobég. Ess. Fl. Guin. Franç. p. 217.

Tropical Africa. French Guinea; from Fouta Djallon to Kouroussa, in dry land.

Elymandra is a striking and extreme modification of the *Hyparrhenia* type, with numerous spikelets, of which, however, only the sessile spikelet of the terminal trio is bisexual and fertile, all others being ♂ or more rarely neuter; those below the trio, being arranged in distinctly separated homogamous and homomorphous pairs, give the plant some resemblance to *Heteropogon*.—O. Stapf.

Fig. 1, terminal trio of spikelets, with one of the pedicelled spikelets removed; 2, fertile spikelet (back view) somewhat flattened, with adjacent pedicel; 3, upper glume; 4, valve of lower floret; 5, valve of upper floret with base of awn (3–5 of fertile spikelet); 6, lower glume; 7, upper glume; 8, lower valve (6–8 of ♂ spikelet). *All enlarged.*

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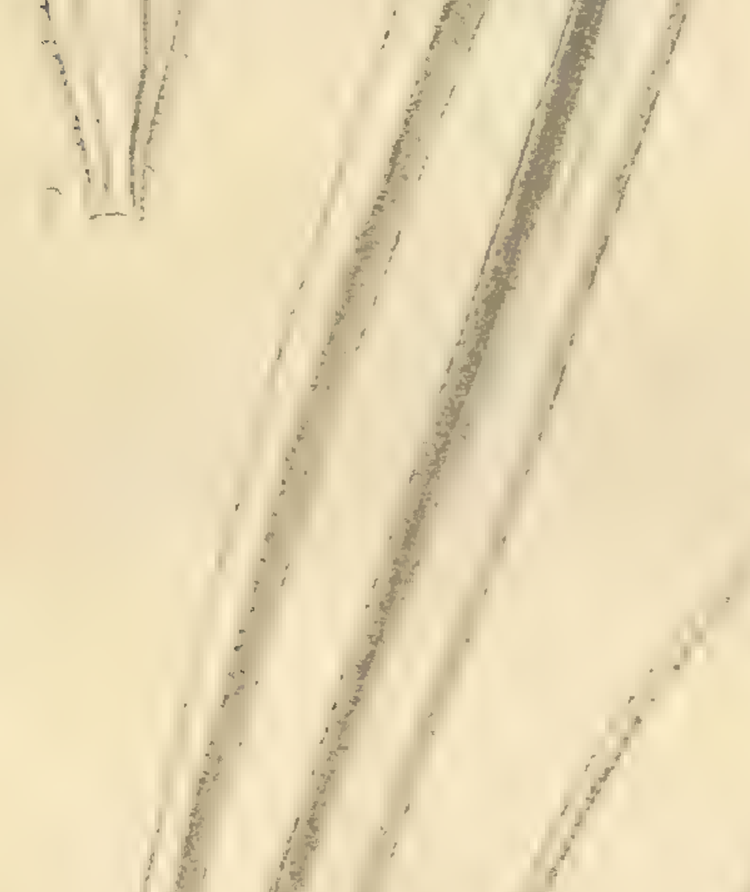

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2

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Tabula 3093.

DIHETEROPOGON GRANDIFLORUS, *Stapf.*

Gramineae. Tribus Andropogoneae.

Diheteropogon, *Stapf* (*gen. nov.*); sectioni *Piestio Andropogonis* proximus, sed homogamia parium muticorum persistentium 3–9 utriusque racemi et spiculis pedicellatis maximis distinctus. Nullo modo *Heteropogoni* affinis sed spiculis pedicellatis maxime conspicuis memoriam eius repetit.

Spiculae 2-natae, parium infimorum 3–9 homogamae, ♂ vel neutrae sed uti reliquae (qui sunt heterogamae) heteromorphae, una sessilis, altera pedicellata, in rhachi racemorum geminatorum culmos terminantium inter paria heterogama articulata fragili caeterum tenaci; racemorum paria e vagina spathiformi longa tandem magis minusve exserta; spiculae sessiles ♀ cum articulo et spicula pedicellata deciduae, ♂ vel neutrae, diu persistentes; articuli lineares, a dorso (saltem inferne) admodum compressae, inter paria homogama angustiores, glabri, dorso convexi, oblique articulati sed haud disjungentes, inter paria heterogama superne clavato-incrassati et excavati, oblique disjungentes, ad margines albo-ciliati; pedicelli articulis similes nisi magis applanati. *Anthoecia* 2, inferum ad valvam redactum, superum ♀ in spiculis sessilibus parium heterogamorum, ♂ vel neutrum in iis parium homogamorum et in spiculis pedicellatis. *Spiculae sessiles* ♀ inter articulos et pedicellos adjacentes arcte retentae, subteretes vel faciem versus a latere compressae, aristatae; callus longiusculus, pungens, linea dorsali excepta dense tomentosus. *Glumae* aequilongae, subcoriaceae; inferior dorso inter carinas depressa vel alte sulcata, carinis supra sulcam approximatis, lateribus latis laxe inflexis; superior navicularis, dorso rotundato imo apice tantum carinata, 3-nervis. *Valva* anthoecii inferioris ciliata, hyalina, 2-nervis, superioris eciliata bifida, e sinu aristata, praeter lobos et margines hyalinos indurata; arista valida. *Valvula* brevis, hyalina, tenuiter 2-nervis. *Stamina* 3. *Lodiculae* 2, cuneatae, majusculae. *Stigmata* lateraliter exserta; styli terminales, quam stigmata multo breviores. *Spiculae sessiles* ♂ vel *neutrae*, spiculis ♀ similes, sed callo nudo, arista nulla, gluma inferiore dorso minus depressa vel sulcata. *Spiculae pedicellatae* maximae, planae, acutae, imbricatae. *Gluma* inferior herbaceo-membranacea, lata, inaequaliter e carinas alata, multinervis, superior

multo tenuior angustior lateribus hyalinis ciliatis inflexis, 5–9-nervis. *Valvae* hyalinae; inferior ciliata, 3-nervis, vacua, superior eciliata, apice emarginata, interdum e sinu aristulata cum valvula brevi enervi glabra.—Gramina perennia, robusta vel graciliora; culmi simplices; foliorum laminae angustae vel angustissimae; ligulae membranaceae, longiusculae.—*Andropogon* § *Diheteropogon*, Hack. Mon. Androp. p. 647.

Species 3, in Africa tropica occidentali.

D. grandiflorus, *Stapf* (*comb. nov.*); a *D. Buchneri*, Stapf (*Andropogon Buchneri*, Hack.), differt spicularum paribus homogamis pluribus, articulis inter paria heterogama longius ciliatis, spiculae ♀ gluma inferiore glaberrima.

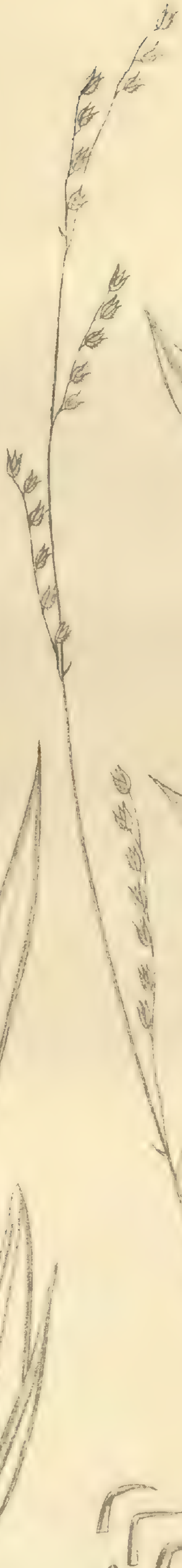
Gramen perenne, ad 2 m. altum. *Culmi* erecti, simplices, paucinodes, teretes, laeves, glabri. *Folia* glabra; vaginae teretes, prominule striatae, praeter imam quam internodia breviores; ligulae firme scariosae, rotundato-truncatae, 1·5 mm. longae; laminae lineares e basi paulo contracta, planae, perlonge in apicem setaceum attenuatae et arcte involutae, rigidae, ad 25 cm. longae et infra medium ad 10 mm. latae, saepius vero angustiores, praeter margines subscaberulos laeves, nervis utrinque prominulis, costa tenui. *Racemi* ad 13 cm. longi, unus sessilis, alter pedunculo 1 cm. longo suffultus, 5–7 mm. lati, primo contigui, demum paulo divergentes et suberecti, virescentes; spicularum paria homogama ad 9 (saepius pauciora); articuli inter ea lineares, dorso convexi et superne obscure carinati, apice uno latere in dentem producti, facie concavi, 6–8 mm. longi, glaberrimi, inter paria heterogama similes nisi dorso magis convexa et ad latera dense albo-ciliata ciliis 1 mm. vix longioribus, apice excavati, brevius dentati; pedicelli articulis adjacentibus similes nisi magis applanati. *Spiculae sessiles* lineares vel oblongo-lineares, sub apice paulo constrictae, callo 4 mm. longo excluso 8–9 mm. longae. *Gluma* inferior inter carinas crassas obtusas late sulcata, glaberrima, apice hyalino ad utramque carinam tenuiter 3–4-nervis; superior dorso linea leviter depressa notata, acumine tenui in aristulam excurrente ad latera hyalino 3 mm. longo marginibus ciliatis. *Anthoecium inferum* valva 6 mm. longa. *Anthoecium superum*: valva 4·5 mm. longa, marginibus hyalinis latis, lobis obtusis fere 1·5 mm. longis; arista 9–11 cm. longa, fulva, columna breviter pilosa laxe torta, seta scaberula; valvula 3 mm. longa. *Antherae* 5 mm. longae. *Spiculae sessiles* ♂ et *neutrae* glumis apice minus vel vix hyalinis, antheris 5 mm. longis vel varie hebetatis. *Spiculae pedicellatae* 18–22 mm. longae, ad 4 mm. latae; gluma inferior ala latiore superne ad 2 mm. lata. *Antherae* ad 10 mm. longae.—*Andropogon grandiflorus*, Hack. in Flora 1885, p. 127 et in Mon. Androp. p. 648.

Tropical Africa. Northern Nigeria; Nupe, in open plains, *Barter*, 1373.

A very similar plant was collected by Dybowsky in the French Gaboon in 1891, but the specimen is too incomplete to admit of its

precise determination. Two other sheets, however, in Vanderyst's collections (nos. 2661 and 3832) from the Kwango and Stanley Pool Districts of the Belgian Congo belong clearly to a distinct species of the genus, so that *Diheteropogon* is so far known from at least three species. The nearest approach to *Diheteropogon* may be found in *Andropogon filifolius*, and it is, in fact, a moot question whether it should not be transferred to *Andropogon*. Nees, led no doubt by a superficial resemblance with *Heteropogon*, actually described it as *Heteropogon filifolius*. It lacks, however, the extreme differentiation into homogamous and heterogamous pairs of spikelets which is so conspicuous a feature in *Diheteropogon*, although it possesses generally one or two homogamous pairs at the base of the peduncled or of both racemes, a character present in a less pronounced degree in most species of the section *Piestium*.—O. Stapf.

Fig. 1, part of fertile portion of raceme with the pedicelled spikelets removed, back view of raceme; 2, fertile spikelet with adjacent joint and pedicel; 3, diagram of same with pedicel on the left and joint on the right; 4, lower glume flattened out; 5, upper glume flattened out and flaps turned back; 6, valve of lower floret; 7, valvule of upper floret; 8, valve of upper floret (4–8 of fertile spikelet); 9, lower glume; 10, upper glume flattened out; 11, same as in natural state; 12, valve of lower floret; 13, valve of upper floret; 14 (12 at the bottom by error), valvule of same (9–14 of pedicelled spikelet). *All enlarged, except fig.* 1, *which is of natural size.*



A.W.D. del. et. Lith.

D.K.H. anal

Tabula 3094.

PSEUDECHINOLAENA POLYSTACHYA, *Stapf.*

Gramineae. Tribus Paniceae.

P. polystachya, *Stapf in Prain, Fl. Trop. Afr.* vol. ix. p. 495; species generis unica.

Gramen annuum, e basi prostrata saepe 30 cm. longa ad 30 cm. ascendens, parte prostrata ramos numerosos culmos secundarios formantes edente. *Culmi* graciles, supra ramos summos 5–8-nodes, teretes, glabri. *Foliorum* vaginae arctae, teretes, prominenter striatae, ciliatae, praeterea magis minusve pilosae vel glabrae; ligulae tenuiter membranaceae, truncatae vel rotundatae, vix 2 mm. longae, ciliolatae; laminae lanceolatae e basi contracta et saepe paulo obliqua, acute acuminatae, infimae 1·2 cm., superiores ad 3·6 cm. longae, 4–12 mm. latae, molles, saturate virides, supra glabrae vel pilis sparsis rigidulis obsitae, infra tenuiter appresse pubescentes, costa tenui pallida, nervis tenuibus numerosis arctis. *Inflorescentia* ad 15 cm. longa et e racemis 6–8 constituta, plerumque vero multo brevior, interdum ad racemum unicum redacta; axis communis subteres, ad racemorum insertionem canaliculatus, glaber, sublaevis, 0·5 mm. latus. *Racemi* spiciformes, axi communi appressi vel oblique patuli, ad 3·6 cm. longi, saepe admodum abbreviati; rhachis filiformis, triquetra, vix 0·25 mm. latior, minute puberula, internodiis valde inaequalibus, haud rare ad 10 mm. longis; pedicelli filiformes, angulati, valde inaequales, brevissimi vel ad 2 mm. longi. *Spiculae* oblique ovoideae, lateraliter compressae, hiantes, ad 4 mm. longae, saepe perfectionis gradu vario, inferiores racemorum vel cuiusque paris saepe hebetatae. *Glumae* herbaceae, aequilongae, vel inferior brevior; inferior oblonga vel ovato-lanceolata, acuminata, applanata, prominule 3-nervis, glabra vel parcissime setulosa; superior navicularis, basi gibbosa, acuta, apice lateraliter compressa, 7-nervis, inter nervos areolas pellucidas exhibens et ex iis pilos gerens basi crassiusculos apicem versus abrupte infractos et in setas tenues saepissime porrectas abeuntes, pilis numero et magnitudine admodum variis interdum ad tuberculos redactis. *Anthoecium inferum* ♂ vel neutrum spiculam aequans: valva oblongo-lanceolata, minute truncata, lateraliter compressa, haud vero carinata, chartacea, marginibus membranaceis, basi areola hyalina oblonga notata, laevis; valvula subaequalis, sub-2-nervis. *Anthoecium*

superum ♀ : valva late lanceolata vel oblonga, dorso valde convexa, 2 mm. longa, chartacea, tenuiter 5-nervis, straminea, nitida ; valvula textura similis, arcte valva amplexa. *Antherae* 1·75 mm. longae. *Caryopsis* oblonga, dorso valde convexa, 1·6 mm. longa, 0·6 mm. lata.—*Echinolaena polystachya*, H.B.&K. Nov. Gen. et Sp. vol. i. p. 119, t. 679. *E. Trinii*, Moritzi, Syst. Verz. Zoll. p. 102. *Lappago aliena*, Spreng. Neue Entdeck. vol. iii. p. 15. *Panicum uncinatum*, Raddi, Agrost. Bras. p. 41, Hook. f. Fl. Brit. Ind. vol. vii. p. 58 (sub § *Pseudechinolaena*). *P. glandulosum*, Nees ex Trin. Gram. Pan. p. 174, and Agrost. Bras. p. 128. *P. nemorosum* β, Trin. l.c. *P. heteranthum*, Link, Hort. Berol. vol. i. p. 212. *P. echinatum*, Willd. ex Doell. in Mart. Fl. Bras. vol. ii. pars ii. p. 193. *P. polystachyum*, K. Schum. in Engl. Pfl. Ost-Afr. C. p. 103, non aliorum.

Tropics of both Hemispheres. Widely distributed, particularly in forests and other shady or moist places, often in cultivations.

Echinolaena, to which genus the species figured here is now generally referred, is by its standard species a distinct genus, characterised by rather large spikelets tightly packed in solitary secund spiciform racemes, and confined to the New World.—O. Stapf.

Figs. 1 and 2, spikelets (1, with the characteristic hooked bristles) ; 3, hooked bristles from the back of upper glume ; 4, lower glume ; 5, lower floret, showing the hyaline area (" window ") at the base ; 6, valve of same, flattened out ; 7, fertile floret ; 8, fruiting floret with valvule removed ; 9, caryopsis. *All enlarged.*

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A W D del et lith

W & A.K. Johnston

Tabula 3095.

LEUCOPHRYS MESOCOMA, *Rendle.*

Gramineae. Tribus Paniceae.

L. mesocoma, *Rendle in Cat. Afr. Pl. Welw.* vol. ii. p. 194; ab altera specie generis differt duratione perenni, spiculis plus quam duplo majoribus laxe racemosis, glumis aequalibus, dispositione pilorum spicularum.

Gramen perenne, ad 60 cm. altum, a basi ramosum, glaucum. *Culmi* e basi adscendentes, iterum geniculati, multinodes, teretes, glabri. *Foliorum* vaginae laxiusculae, basi in annulum spongiosum incrassatae, saepe solutae et demum delabentes, glabrae, nisi infimae tenuiter pubescentes; ligulae ad lineam pilorum minutorum redactae; laminae lineares, longe in apicem callosum saepe spinescentem et recurvum attenuatae, planae vel saepius involutae, ad 7·5 cm. longae, saepe multo breviores, 2–5 mm. latae, glabrae vel molliter pubescentes, costa nervisque tenuibus. *Panicula* angusta, 7·5–15 cm. longa, e racemis 5–6 erectis 3·75–1·25 cm. longis plerisque simplicibus a basi spiculigeris composita; axis communis teres, flexuosus, glaber, internodiis inferioribus racemos excedentibus vel aequantibus; racemi rhachis tenuiter filiformis, flexuosa, glabra vel nodos versus parce pilosa; pedicelli apice discoidei, scaberuli, breviter pilosi vel subglabri, laterales ad 1·5 mm. longi, terminales multi longiores. *Spiculae* ovato-lanceolatae, acuminatae, a dorso subcompressae, stipiti 1·5–0·8 mm. longo insidentes, cum eo deciduae, eo incluso ad 8 mm. longae, albidae. *Glumae* spiculam aequantes, delicate membranaceae; inferior basi sericeo-pilosa, superne glabra, ciliata; superior rostrata vel subulato-acuminata, 3-nervis, infra medium firmior, pubescens, medio transverse sericeo-barbata pilis glumam aequantibus, superne tenuis, glabra, nisi ad margines ciliolata, 5–7-nervis. *Anthoecium inferum* ♂: valva glumae superiori aequilonga et similis, sed minus acuminata, longitudinaliter depressa et subhyalina, barba medio interrupta; valvula valvae subaequalis, acuta, carinis scaberulis. *Anthoecium superum* ♀, late oblongum, subobtusum; valva laevis, tenuiter 5-nervis, demum crustacea, straminea, 3 mm. longa; valvula valvae textura similis, 2-carinata. *Antherae* 2 mm. longae.—Chase in Proc. Biol. Soc. Wash. vol. xxiv. p. 123; Stapf in Prain, Fl. Trop. Afr. vol. ix. p. 503. *Panicum mesocomum,* Nees, Fl. Afr. Austr. p. 34; Steud. Syn. Pl. Glum. vol. i. p. 88; Dur. & Schinz, Consp. Fl. Afr. vol. v. p. 754; Stapf in Dyer, Fl. Cap. vol. vi. p. 387.

Tropical Africa and South Africa. Angola: Mossamedes, in gravelly soil by the River Bero, *Welwitsch*, 2295. South-East Africa: Great and Little Karas mountains, on the sandy banks of streams, *Pearson*, 8519, 9740; Little Namaqualand, by the Orange River near Verlaptpraane, *Drège*, 2537.

Leucophrys is a small South African genus, confined to the South-west African desert region from Mossamedes to the Orange River. The only other species of the genus is *L. glomerata*, Stapf. For a description of this plant and remarks on the position and characters of the genus, see Flora of Tropical Africa, pp. 504 and 505.—O. Stapf.

Fig. 1, spikelet; 2, lower glume flattened out; 3, upper glume from within; 4, lower floret in back view; 5, half of valve of lower floret; 6, valvule of same, back view; 7, upper (fertile) floret; 8, valvule of same. *All enlarged.*

PL.3096

A.W.D. del. et lith.

M.S anal

Tabula 3096.

CYRTOCOCCUM TRIGONUM, *Stapf.*

Gramineae. Tribus Paniceae.

C. trigonum, *Stapf* (*comb. nov.*) ; affinis *C. oxyphyllo,* Stapf (nov. comb. e *Panico oxyphyllo,* Hochst. ex Steud.), sed tota minor, foliis brevioribus, panicula minore parciore, spiculis hirsutiusculis differt.

Gramen perenne, 15–30 cm. altum. *Caules* e basi longe prostrata multi-ramosa radicante ascendentes, subfiliformes, multinodes, teretes, glabri, partibus basalibus intricatis, ramis erectis. *Foliorum* vaginae teretes, primo arctae, inferiores ramos subpetentes demum solutae, ad margines dense ciliatae ciliis os versum saepe longis, caeterum glabrae vel pilis e tuberculis minutis ortis magis minusve praeditae ; ligulae scariosae, brevissimae, truncatae ; laminae anguste lanceolatae, acute acuminatae, subpatentes, 2–4·5 cm. longae, 3–5 mm. latae, planae, tenuiter herbaceae, glabrae vel sparse pilosae, costa tenui, nervis tenuibus arcte congestis. *Paniculae* in ramis terminales, contractae, angustissimae, raro 3 cm. longiores, ad tertium ordinem divisae ; axis primarius et rami et ramuli tenues, magis minusve angulati, glaberrimi, laeves ; rami erecti vel oblique erecti, rigiduli, infimus raro dimidiam paniculam excedens ; ramuli superiores breves ; pedicelli teretes, plerumque brevissimi, apice minute disciformi. *Spiculae* 4–2-nae, glomerulatae, glomerulis plerumque secunde approximatis, rarius dissitis, more generis gibbosae et a latere compressae, 1·4–1·8 mm. longae, ad 0·8–0·9 mm. latae, obtusiusculae, griseo-virides. *Glumae* tenuiter membranaceae ; inferior anthoecio inferiori appressa, et eius dimidiam partem circiter aequans, ovata, acuta, 3-nervis, a medio vel saltem apicem versus appresse pilosa ; superior cymbiformis, a latere visa oblique lanceolata, subacuta, quam inferior longior, 3-nervis, a medio appresse pilosa, apicem versus minute villosula et ciliata. *Anthoecium inferum* ad valvam alte cymbiformem obtusam spiculam aequantem 5-nervem indumento glumarum simili indutam redactum. *Anthoecium superum* ♀: valva quam infera paulo brevior, alte gibboso-cymbiformis, a facie visa anguste oblonga, obtusa, apice incrassata et subcristata crista carunculiformi primo viridula demum albida crassiuscula, coriaceo-crustacea, 5-nervis, nervis exterioribus margini proximis ; valvula 2-nervis, dorso anguste oblonga, obscure rugulosa, quam valva tenuior, lateribus inflexis latiusculis. *Antherae* circiter 0·7 mm. longae. *Caryopsis*

fructui spurio conformis, paulo ultra 1 mm. longa, a latere 0·7 mm., a dorso 0·4 mm. lata ; embryo 0·7 mm. longus.—*Panicum trigonum*, Kunth, Enum. Pl. vol. i. p. 116 ; Nees, Agrost. Bras. p. 206 ; Miq., Fl. Ind. Bat. vol. iii. p. 456 ; Thw. Enum. Pl. Zeyl. p. 358 ; Hook. f., Fl. Brit. Ind. vol. vii. p. 57, et in Trim. Handb. Fl. Ceyl. vol. v. p. 157 (omnia pro parte, non Roxb.). *P. difforme*, Roth ex Roem. & Sch. Syst. vol. ii. p. 433, et Nov. Spec. p. 52.

India. Ceylon : Trincomali (5, ii. 1789) and " Kurhangusonadi " (5, ii. 1809), *Rottler* (H. C. Wight, no. 1637), and without precise locality, *Walker* ; *Thwaites* 788. Madras Presidency : Courtallam, *Wight*, Distr. no. 3048. Chingleput Distr. ; Kambakam Drug, *Bourne*, 2478, and without precise locality, Herb. *Heyne* in Herb. *Wallich*, 8743 A and B. Bengal : Hugli Distr. ; Howrah, *Nusker*, 1304 ; near the Calcutta Botanic Garden, *Wallich*, 8743 C.

Cyrtococcum corresponds to Hooker's Section *Gibbosae* (Fl. Brit. Ind. vol. vii. pp. 28, 56) and Presl's Section *Steirachne* (Rel. Haenk. p. 309), both of *Panicum* (sensu lato). The genus is easily recognised by the laterally much compressed spikelets and the peculiar shape of the fruiting floret, to which the tightly enclosed caryopsis conforms. The fruiting floret, or ' false fruit,' is so much curved or gibbous on the back that it has even been described as semilunar. The back is rounded and the broad smooth sides are almost flat and parallel. The valve is thickly coriaceous-crustaceous right up to the margins. The narrow back of the valvule is of similar texture, but thinner, whilst the rather wide flaps, which are completely embraced by the valve, are thinner still. The latter bears close to the tip a curious thickening like a minute crest which on maturity assumes the appearance of a small caruncle. It is at that stage sharply differentiated from the contiguous tissues and traversed longitudinally by a strand of tracheids which branches off from the midnerve of the valve at the base of the caruncle.

There are about seven or eight species referable to this genus, one of which is confined to West Africa, whilst the others are found in the Indo-Malayan region. These represent two easily distinguished groups, one with the spikelets crowded together in somewhat secund contracted panicles (*C. trigonum* and *C. oxyphyllum*), the other with often long-pedicelled spikelets and at least temporarily open or even widely effuse panicles. The species of these groups are mostly very closely allied and difficult to discriminate, and their synonymy is consequently confused. To it belong *C. patens* (*Panicum patens*, L.), *C. radicans* (*P. radicans*, Retz ; *P. obliquum*, Roth ; *P. carinatum*, Presl ; *P. gibbum*, Steud.), *C. accrescens* (*P. accrescens*, Trin.), *C. longipes* (*P. longipes*, Wight ex Hook. f.), and *C. Warburgii* (*P. Warburgii*, Mez). The combinations are mine. *P. multinode*, Lam. of Mauritius, quoted by Hooker (Fl. Brit. Ind. vol. vii. p. 57) as possibly identical with *Panicum pilipes*, Nees & Arn. ex Buse, is an entirely different species of *Panicum* (sensu meo).

I have given the epithet *oxyphyllum* priority over *pilipes*, as Steudel's description of the former antedates that of the latter probably by several months. Another synonym of *C. oxyphyllum* is *Panicum hermaphroditum*, Steud.

The specimen selected for drawing (C. P. 791) exhibits an unusually lax panicle and is by no means characteristic of the species.—O. STAPF.

FIG. 1, part of panicle; 2, lower glume; 3, upper glume (pubescence omitted); 4, valve of lower floret from within; 5, valve of upper floret; 6, upper floret in front view; 7, valvule of same. *All enlarged.*

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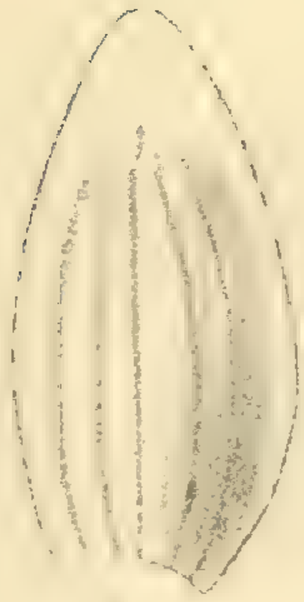

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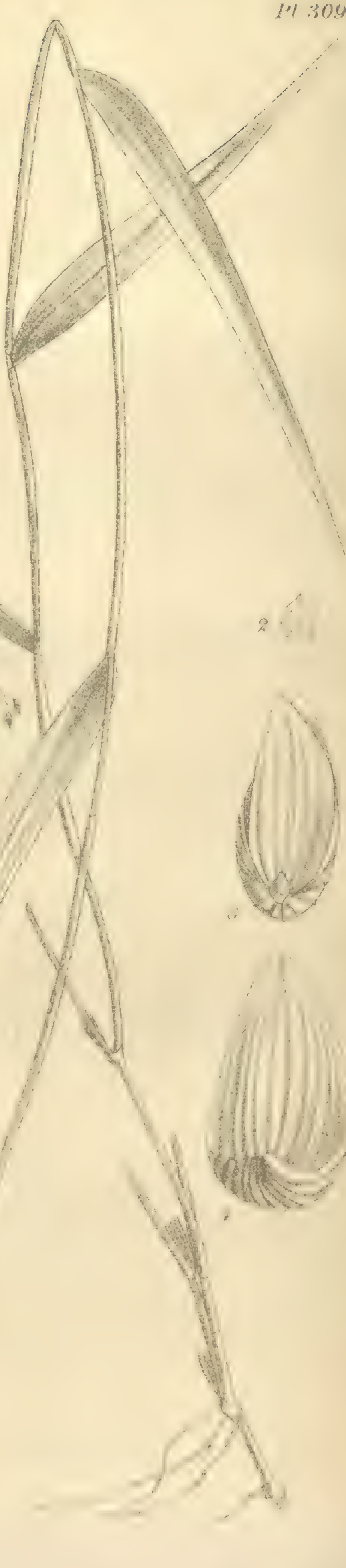

AWD. del. et. lith

Tabula 3097.

SACCIOLEPIS CURVATA, *Chase.*

Gramineae. Tribus Paniceae.

S. curvata, *Chase in Proc. Biol. Soc. Wash.* vol. xxi. p. 8; a caeteris generis speciebus inflorescentia laxe paniculata, spiculis valde gibbosis hiantibus distincta.

Gramen perenne, 30 cm. ad fere 1 m. altum. *Culmi* e rhizomate gracili mox dissoluto geniculatim ascendentes vel basi prostrati, graciles, inferne ramosi, ramis erectis 4–7-nodibus teretibus glabris. *Foliorum* vaginae arctae, glabrae laevesque vel ad margines tenuiter ciliolatae; ligulae ad lineam minute ciliolatam redactae; laminae lanceolato-lineares vel lineares e basi constricta, acutae, 5–8 cm. longae, 4–7 mm. latae, tenues, glabrae, ad margines scaberulae, costa nervisque tenuibus. *Panicula* erecta, demum plerumque longe exserta, ambitu ovata vel ovato-oblonga (aperta), 4–12 cm. longa, ad tertium vel quartum gradum divisa; axis communis tenuis, ut omnes rami ramulique teres, laevis, magis minusve flexuosus; rami primarii plerumque solitarii, subcapillares vel capillares, a basi divisi, saepe patentes, infimus dimidiam paniculam aequans; ramuli racemos simplices vel subcompositos 2–7-spiculatos magis minusve secundos referentes; pedicelli 1–2 mm. longi. *Spiculae* oblongae, valde obliquae, gibbosae, hiantes, 2·5–2·8 mm. longae, virides, glabrae. *Glumae* admodum inaequales; inferior ad squamulam minutam ovatam tenuem sub-1–3-nervem redacta; superior a latere visa oblique ovato-lanceolata acutaque, a dorso ovata, valde gibbosa, spiculam aequans, herbaceo-membranacea, 9–11-nervis. *Anthoecium inferum* ♂: valva a latere visa sublinearis, a dorso oblonga, caeterum glumae superiori similis et ei aequilonga, 5-nervis; valvula hyalina. linearis, 2-nervis quam valva brevior. *Anthoecium superum* ♀, elliptico-oblongum, obtusum, ad 1·5 mm. longum, flavescens, laevissimum: valva valvulaque tenuiter crustaceae, illa tenuiter 5-nervis. *Antherae* 0·6 mm. longae. *Caryopsis* late elliptica, subplano-convexa, 0·8 mm. longa, 0·4 mm. lata.—Stapf in Prain, Fl. Trop. Afr. vol. ix. p. 766. *Panicum curvatum,* Linn. Syst. Nat. ed. xii. p. 732; Steud. Syn. Pl. Glum. vol. i. p. 67; Hook. f. Fl. Brit. Ind. vol. vii. p. 42; Stapf in Dyer, Fl. Cap. vol. vi. p. 415. *P. coryophorum,* Kunth, Rev. Gram. vol. i. tab. 107; Steud. l.c. p. 67.

Africa and India. East Africa: from British East Africa to Natal (nowhere far inland). Islands of the Indian Ocean, Ceylon, the southern part of the Madras Presidency.

A somewhat aberrant type which is, however, sufficiently closely connected with the bulk of *Sacciolepis* to admit of its treatment as a specialised section (Sect. *Rhampholepis*, Stapf in Prain, Fl. Trop. Afr. vol. ix. p. 748), rather than as a distinct genus as I had proposed (l.c. p. 15).—O. Stapf.

Fig. 1, group of spikelets; 2, lower glume; 3, spikelet (front view) with lower glume and lower valve in front; 4, upper glume from within; 5, valve of lower floret; 6, valvule of same; 7, valve of fertile floret; 8, valvule of same; 9, grain. *All enlarged.*

AW.D. del et lith.

O.S Anal

Tabula 3098.

XYOCHLAENA MONACHNE, *Stapf.*

Gramineae. Tribus Paniceae.

X. monachne, *Stapf* (*comb. nov.*); a caeteris speciebus generis spiculis glaberrimis distincta.

Gramen perenne, 0·5–1·25 m. altum. *Culmi* fasciculati, e basi ramosa prostrata vel ascendente geniculata erecti, rarius toti recti vel subrecti, inferne indurati, teretes, multinodes, glabri, laeves. *Foliorum* vaginae arctae nisi ramis solutae, teretes, striatae, glabrae vel infimae breviter appresse hirsutae, inferiores diu persistentes, demum confractae; ligulae ad limbum dense ciliatum redactae; laminae lineares, longe in apicem tenuem subcallosum subacutum attenuatae, 4–10 cm. longae, plerumque 2–5 mm. latae, raro latiores (ad 10 mm.), flexuosae vel breviores rigidulae, planae vel involutae, glaucidulae, glabrae vel breviter pubescentes, laeves, costa nervisque tenuibus paulo conspicuis. *Panicula* erecta, ambitu oblonga vel ovata, interdum perlata, 8–15 cm. longa, 4–10 cm. lata, ad quartum vel quintum gradum divisa, demum laxissima, glaberrima; rhachis uti rami ramulique teres, laevis, gracilis, internodiis inferioribus intermediisque plerumque 2–3 cm. distantibus; rami primarii plerumque 2-nati, rarius solitarii vel pseudo-verticillati, per 1–2 cm. indivisi, deinde ingeminatim ramulosi, filiformes, ramulis capillaribus flexuosis; pedicelli laterales 2–4 mm., terminales ad 10 mm. longi, tenuissimi, apice minute discoidei. *Spiculae* oblongae vel ovato-oblongae, acutae vel subacutae, 2–2·5 mm. longae, glaberrimae, luteo-virides vel varie purpureo-tinctae. *Gluma inferior* ad squamulam minutissimam rotundatam redacta vel plane obsoleta; superior spiculam subaequans, a latere visa oblique lanceolato-oblonga breviter acuta vel subacuta, explanata elliptico-oblonga, apice rotundo- vel truncato-obtusa vel brevissime acuta vel subemarginata, tenuiter membranacea, tenuiter 5-nervis, nervis lateralibus sub apice cum nervo intermedio anastomosantibus. *Anthoecium inferum* spiculam aequans, ♂: valvula valvam subaequans, apice truncatula. *Anthoecium superum* ♀, oblongum, acutum, 1·5–1·7 mm. longum, laevissimum, nitidum, stramineum: valva anguste involuta, iam sub anthesi tenuiter crustacea, obscure 5-nervis; valvula valvae textura similis. *Antherae* 1–1·2 mm. longae. *Caryopsis* ignota.—*Panicum Monachne,* Trin. in Spreng. Neue Entd. vol. ii.

p. 86. *P. madagascariense*, Spreng. Syst. vol. i. p. 317; Dur. & Schinz, Consp. Fl. Afr. vol. v. p. 753; Hack. in Bull. Herb. Boiss. vol. iv. App. iii. p. 14; K. Schum. in Engl. Pfl. Ost-Afr. C. p. 103; Rendle in Cat. Afr. Pl. Welw. vol. ii. p. 182 pro parte; Courdemoy, Fl. Réun. p. 118. *P. airoides*, Nees, Agrost. Bras. p. 175. *Tricholaena glabra*, Stapf in Dyer, Fl. Cap. vol. vii. p. 446; Eyles in Trans. Roy. Soc. S. Afr. vol. v. (1916), p. 301. *Melinis Monachne*, Pilg. in Engl. Bot. Jahrb. vol. xxxiii. p. 51.

Tropical and Subtropical Africa. From South Angola through Rhodesia to Portuguese Africa, thence southward through the Transvaal to Natal and northward through the Tanganyika Territory to British East Africa and Zanzibar. Madagascar and Mascarenes.

Xyochlaena comprises a number of species which might be classed either with *Tricholaena* or with *Melinis* if their characters were correspondingly extended, but by doing so the discrimination of the two remaining genera would become so doubtful that they in turn would have to be united into *Tricholaena* sensu lato. A *Tricholaena*, however, of so wide a conception would immediately challenge its own reduction to a *Panicum* sensu lato, a procedure evidently inexpedient. I have therefore preferred to co-ordinate this small group with *Tricholaena* and *Melinis* and treat it as a distinct genus. The following species are referable to it: *X. arenaria* (*T. arenaria*, Nees), *X. capensis* (*T. capensis*, Nees), and possibly *X. vestita* (*Panicum vestitum*, Balf. f.). The combinations are all mine. *X. arenaria* and *X. capensis* are natives of the drier parts of South Africa, whilst *X. vestita* is confined to Socotra. They are, like *X. monachne*, eminently xerophytic grasses, and often found under conditions of desert type. The name *Xyochlaena* is intended to allude to the reduction or absence of the silky indumentum of the spikelets of *Tricholaena*. The epithet *monachne* has nothing to do with the genus *Monachne* of Beauvais, which is by his description and by fig. ix. of tab. x. of his Agrostographia a species of *Eriochloa*, but is, by fig. x. of the same plate, *Panicum Urvilleanum*, Kunth, a totally different type.—O. Stapf.

Fig. 1, pair of spikelets; 2, spikelet in flower; 3, lower glume; 4, upper glume flattened out; 5, half of valve of lower floret; 6, valvule of same, flattened out; 7, upper floret in flower; 8, valve of same, flattened out. *All enlarged.*

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A.W.D. del. et lith.

Tabula 3099.

BRACHYACHNE FULVA, *Stapf.*

Gramineae. Tribus Chlorideae.

B. fulva, *Stapf* (*sp. nov.*) ; affinis *B. convergenti*, Stapf (*Cynodon convergens*, F. Muell.), sed racemis fulvis, glumis latioribus tenue carinatis, anthoecio pro rata majore, valvae et valvulae carinis in mucronulum excurrentibus distincta.

Gramen perenne, probabiliter caespitosum, ad 50 cm. altum. *Culmi* erecti, graciles, 1–2-nodes internodiis longe exsertis, glabri. laeves. *Foliorum* vaginae arctae, teretes, tenuiter striatae, glabrae ; ligulae ad limbum membranaceum angustissimum redactae ; laminae anguste lineares, apice subcalloso acuto, involutae, ad 12 cm. longae, 3 mm. latae (explicatae), crassiusculae, molles, glaberrimae. *Inflorescentiae* terminales e racemis 3–5 digitatis constitutae. *Racemi* spiciformes, suberecti, recti, a basi spiculigeri, apice steriles ; rhachis a dorso applanata, 0·75 mm. lata, anguste hyalino-marginata, margine minute scaberulo ; pedicelli crassiusculi, 0·3 mm. longi. *Spiculae* in facie rhachis alternantes, et ei appressae, 1·5–2 mm. distantes, a latere valde compressae, arcte imbricatae, lateribus axi parallelis, ambitu oblongae, 4·5 mm. longae, primo stramineae, deinde fulvae praeter marginem exteriorem glumae superioris candidum. *Glumae* subaequales, consimiles, a latere oblique anguste oblongae, acutae, membranaceae, glabrae, carina acuta tenui apicem versus scaberula ; inferior paulo brevior, saepe post fructum lapsum diu persistens. *Anthoecium* unicum, rhachilla ultra eius ortum continuata subsetiformi ad 2 mm. longa : valva a latere visa late oblonga, explicata late elliptica, truncato-rotundata vel subemarginata, 3-nervis, nervo medio in mucronulum obscurum excurrente, e nervis (praecipue lateralibus) molliter sericeo-ciliata ; valvula valvam aequans, glabra, carinis approximatis inferne fere confluentibus apice in mucronulos excurrentibus.

Tropical Africa. Belgian Congo : Katanga, *Homblé.*

Bentham in Journ. Linn. Soc. vol. xix. p. 101 (1881), pointed out the " mixed " character of the genus *Cynodon*, referring especially to the Australian species " with the spikelets of *Microchloa*, but with the

inflorescence of *Cynodon*." Subsequently in Genera Plantarum, vol. iii. p. 1164 (1883), he emphasised this point and distinguished the Australian group as a section, *Brachyachne*, from the rest of *Cynodon* (section *Fibichia*), adding these words: "sectiones . . . vix non pro generibus propriis habendae," and under *Brachyachne*, "Sectio a *Microchloa* vix nisi habitu et inflorescentia differt."

To those Australian species have now to be added *M. obtusiflora*, Benth., and the species figured here, both African. The spikelets of all those species are so similar in structure and arrangement that they have to be grouped together in one superior unit, and this should be, in my opinion, of generic rank. The sharply keeled, not dorsally rounded upper glume, and the peculiar orientation of the spikelets, distinguish it from *Microchloa* and *Rendlia*, whilst the inversion of the proportion of the sizes of the glumes and the floret, as well as the delicate texture of the latter, exclude it from *Cynodon*. The rhachilla is continued more or less beyond the floret in all the species, as is also the case in *Microchloa* and *Cynodon Dactylon*, Pers., and *C. transvaalensis*, Burtt-Davy, but not in *C. incompletus*, Nees.—O. Stapf.

Fig. 1, upper end of raceme; 2, part of rhachis of raceme; 3, floret with continuation of rhachilla; 4, lower glume; 5, upper glume; 6, valve; 7, valvule (4–7 flattened out). *All enlarged.*

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AWD.del et.lith.

Tabula 3100.

ODYSSEA MUCRONATA, *Stapf.*

Gramineae. Tribus Eragrosteae.

Odyssea, *Stapf* (*gen. nov.*); proxime affinis *Diplachnae,* Beauv., sed habitu, panicula brevi arcte contracta, glumis hyalinis vel subhyalinis, valvis ad totos nervos laterales et ad nervi intermedii basin sericeo-ciliatis vel villosulis, valvulis ad latera sericeis distincta.

Spiculae breviter pedicellatae vel subsessiles, in paniculam brevem contractam arcte congestae, oblongae, a latere compressae, rhachilla supra glumas et inter anthoecia disarticulata, internodiis brevis, simis pilosulis vel subglabris. *Anthoecia* ad 9, summa hebetata. *Glumae* subaequales, tenuiter membranaceo-hyalinae vel hyalinae, albidae, 1-nerves, subcarinatae vel dorso rotundatae, diu persistentes. *Valvae* dorso rotundatae, superne carinatae, emarginatae, e sinu minute mucronulatae, membranaceae, apicem versus et ad margines hyalinae vel totae subhyalinae, 3-nerves, basi ad nervum medium, in lateribus ad nervos tota longitudine sericeo-ciliatae vel sericeo-villosulae, nervis lateralibus haud excurrentibus. *Valvulae* valvas subaequantes vel paulo breviores, 2-carinatae, carinis interdum in mucronulos minutos excurrentibus, lateribus magis minusve sericeis, apice truncato. *Lodiculae* 2, late cuneatae, carnosulae. *Stamina* 3. *Ovarium* glabrum; styli distincti, breves; stigmata plumosa, lateraliter exserta. *Caryopsis* valva valvulaque exsiccata minime induratis inclusa et cum iis decidua, elliptico-oblonga, a dorso compressa; embryo brevis; hilum punctiforme, basale.—Gramina perennia, dura, saepe rhizomatosa, e basi multiramosa, rhizomate et basibus prostratis arcte vaginis duris subelaminatis vestitis; laminae pungentes, distichae. Paniculae rami semel vel rarius bis divisi, breves, ramulis brevissimis, vel superiores ad spiculam redactae. Spiculae albae vel variegatae.

Species 2, una ad litora ostii Maris Rubri, altera in desertis arenosis Africae austro-occidentalis et territorii Bechuanorum.

O. mucronata, *Stapf* (*comb. nov.*); ab altera species, *O. paucinervi,* Stapf (*Diplachne paucinervis,* Stapf ex Rendle), spiculis albis, glumis valvisque tenuioribus, valvis valvulisque copiose ciliatis, culmis foliisque magis robustis distincta.

Gramen perenne, repens, 5–10 cm. (rarius altius) ascendens, glaucum, nisi inferne demum stramineum; rhizoma durum, repens, ramosum, ramis fasciculos culmorum edens. *Culmi* longe repentes, ramosi, apice ut rami ascendentes, multinodes, omnes arcte vaginati, duri, parte prostrata ad 5 mm. diametro. *Folia* glauca; vaginae teretes, laeves, praeter margines superne ciliatos glaberrimae, arcte nervoso-striatae, omnes internodiis longiores et ea arctissime amplectentes; ligulae ad limbum dense ciliolatum redactae; laminae oblique vel horizontaliter patentes, e basi latiore lanceolato-pugioniformes, marginibus incurvis plerumque paulo supra basin contiguis itaque tubum formantibus, durae, pungentes, glabrae, dorso laevissimae, facie in nervis prominentibus arcte approximatis, papilloso-scaberulae. *Paniculae* densae, ambitu ovatae, 1–3·5 cm. longae, in ramis terminales, albae; rhachis subangulata, uti rami ramuli pedicelli tomentella vel molliter pubescens; rami primarii infimi spiculis demptis raro 1 cm. longi, fere a basi spiculas usque ad 7 gerentes, graciles, intermedii et superiores plerumque ad spiculam solitariam redacti; pedicelli longiores ad 2 mm. longi, saepe multo breviores. *Spiculae* oblongae, 6–8 mm. longae, floribus 5–7, summo hebetato. *Glumae* subaequales (inferior brevior), explanatae, late oblongae, subacutae vel acutae vel interdum obscure emarginatae, ad 4 mm. longae, dorso rotundatae, hyalinae, albae, 1-nerves, nervo supra prominulo, post anthoecia lapsa haud diu persistentes. *Valvae* a dorso visae depressae, late oblongae, e sinu mucronulatae, medio sursum carinatae, 3 mm. longae, hyalinae, albae vel purpureo-tinctae, basin versus et secundum nervos laterales plerumque tota longitudine dense villoso-ciliatae, nervis lateralibus saepe infra apicem desinentibus. *Valvulae* valvis subaequilongis, ad latera villosulae. *Antherae* 2 mm. longae. *Caryopsis* ambitu oblonga, 1·5 mm. longa, ad 0·75 mm. lata, atropurpurea.—*Festuca mucronata*, Forsk. Fl. Aeg.-Arab. p. 22. *F. pungens*, Vahl, Symb. t. 2. *Triodia pungens*, Roem. & Sch. Syst. vol. ii. p. 598. *Calotheca arabica*, Spreng. Syst. vol. i. p. 348. *Uralepis pungens*, Kunth, Rev. Gen. Gram. vol. i. p. 108. *Aeluropus arabicus*, Steud. Nom. vol. i. p. 30; Anders. in Journ. Linn. Soc. vol. v. Suppl. 42; Deflers in Bull. Soc. Bot. France, vol. xliii. p. 331. *A. pungens*, Boiss. Fl. Or. vol. v. p. 595. *A. mucronatus*, Deflers l.c. vol. xxxii. p. 355, non Aschers. *A. brevifolius*, Dur. & Schinz, Consp. Fl. Afr. vol. v. p. 901 (pro parte ex syn.). *A. villosus*, Blatter, Fl. Aden in Rec. Bot. Surv. India, vol. vii. No. 3, p. 399. *Poa sp.*, Hook. f. in Lond. Journ. Bot. vol. vii. p. 297. *Dactylis mucronata*, Steud. Syn. Pl. Glum. vol. i. p. 298. *Eragrostis sp.*, Benth. & Hook. f. Gen. Pl. vol. iii. p. 1187. *E. pungens*, Schweinf. in Bull. Herb. Boiss. vol. ii. App. ii. p. 43; Deflers in Bull. Soc. Bot. France, vol. xxxiv. (1887), p. 69. *Diplachne mucronata*, Hack. ex Schinz in Vierteljahrsschr. Nat. Ges. Zürich, vol. lvi. p. 81, quoad syn.

Tropical Arabia, Socotra and Somaliland. Arabia: Yemen; Loheia, *Forskål*; Hodeida, common on sandhills, *Forskål*, *Deflers*,

Schweinfurth, 156; Beith e Fakih, *Forskål*; Mokha, east of Beith el Fakih, *Forskål*; Aden, in sand by the sea, *J. D. Hooker*, *Thomson*, *Lunt*, 343, *I. B. Balfour*, *Anderson*; Sheikh Othman, *Schweinfurth*, 127; Shugra, *Schweinfurth*, 141; Wadi Shign, west of Bolhaf, *Schweinfurth*, 148. Perim, *Farmer*; *Coomaraswamy*. British Somaliland: Bulhar, *Drake-Brockman*, 667, 671, 672, 673, 674, 680, 682; without precise locality, *Drake-Brockman*, 332.

This is the grass of which Drake-Brockman (Brit. Somaliland, p. 46) says: "A curious grass, useless as an animal food owing to its spiky nature, very aptly called by the Somalis 'Afrug,' which means the 'mouthbreaker.' This coarse grass holds up the sand in mounds, and if planted in places where the sea is encroaching too far, might in a few seasons raise an impenetrable barrier to its further progress." Schweinfurth, l.c., describes it as covering the shore near Hodeida and forming the only vegetation over wide areas, whilst at Shugra it is building sandhills up to 16 ft. high and covering them with thick cushions, the greater part of the plant being buried in sand. Near Aden it is equally common, and in places the only plant.

There are few grasses, if any, which have experienced as many and as varied generic transferences and corresponding combinations as the grass described here. In the course of time it has become connected with no fewer than nine mostly widely different genera—a veritable Odyssey, hence the name—but it may be hoped that it has at last reached a safe port. Bentham was the first to suggest an approximately correct affinity, when he placed it in his new section *Sclerostachys* of *Eragrostis*; but by doing so he rendered this section, which also included *Eragrostis spinosa* and *Brizopyrum mucronatum*, Nees (=*Halopyrum mucronatum*, Stapf), still more heterogeneous, and at the same time introduced an element into *Eragrostis* which would imply the inclusion of *Diplachne* in *Eragrostis*. For it is evident that *Odyssea*, if not given generic rank, will have to be classed as a subgenus of *Diplachne*. Hackel, l.c., has already proposed the transference of *O. mucronata* to *Diplachne*, and I myself have carried it out for the other species of the new genus mentioned above (see Rendle in Cat. Afr. Pl. Welwitsch, vol. ii. p. 232, and Stapf in Fl. Cap. vol. vii. p. 593), whilst Pilger in Engl. Bot. Jahrb. vol. xliii. p. 95 proposed a new subgenus *Herpodiplachne* of *Diplachne* for the latter. But a complete revision of the genus *Diplachne* has convinced me that *Odyssea* has as much claim to be separated generically from *Diplachne* as the latter has to be distinguished from *Eragrostis*. It is homogeneous in itself and leaves the rest of *Diplachne* an equally homogeneous whole, while at the same time it is easily recognised and remembered. *Diplachne Jaegeri*, Pilg. l.c. p. 94, from Lake Eyasi, East Africa, seems to be a third species of *Odyssea*.—O. Stapf.

Fig. 1, spikelet with glumes removed; 2, florets; 3, lower glume; 4, upper glume; 5, valve; 6, valvule (5 and 6 in back view, flattened out); 7, grain, back view; 8, grain, front view; 9, section of grain through the middle. *All enlarged.*